THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXXI. No. 771.] LONDON, FEBRUARY 19, 1878. [30TH YEAR.] Price 6d.

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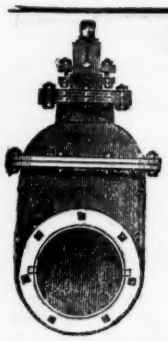

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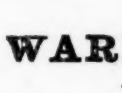

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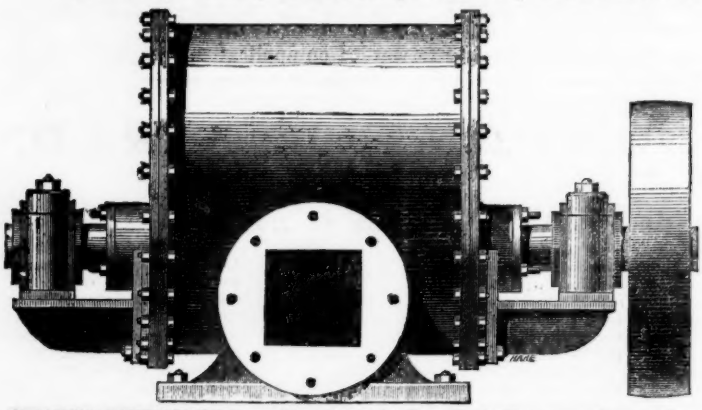

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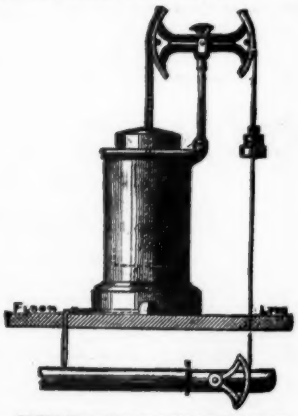

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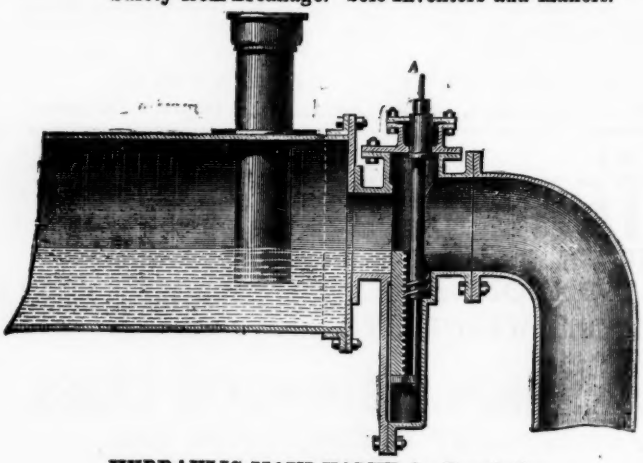

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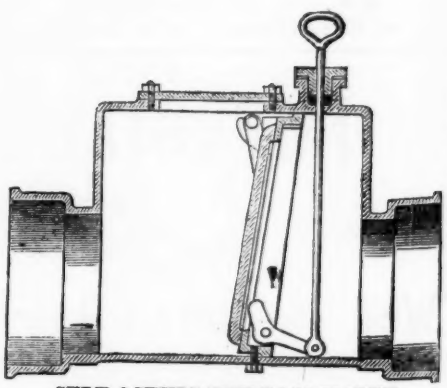

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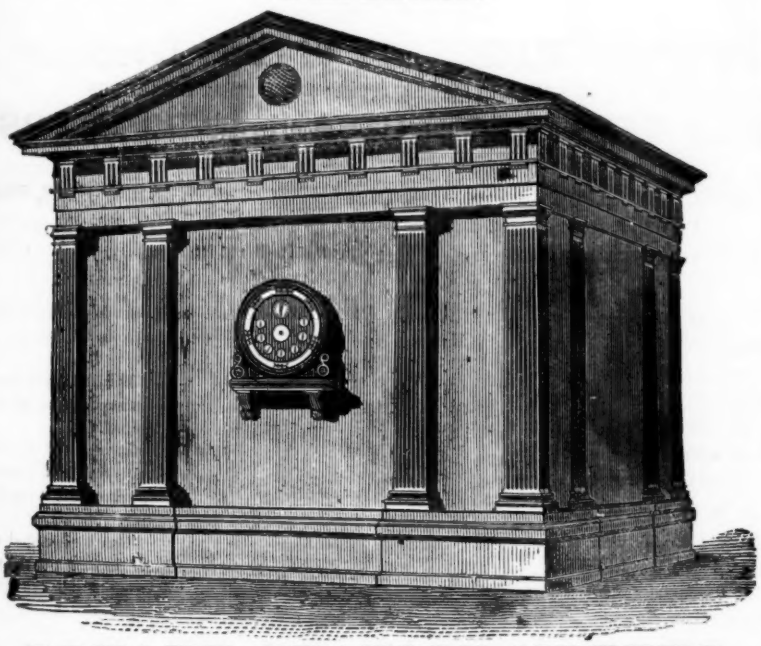

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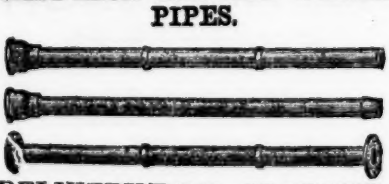
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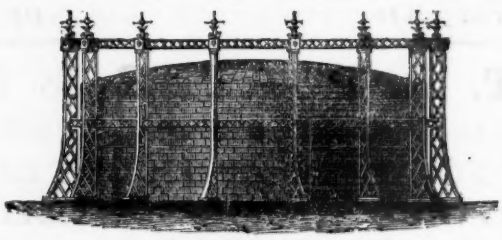
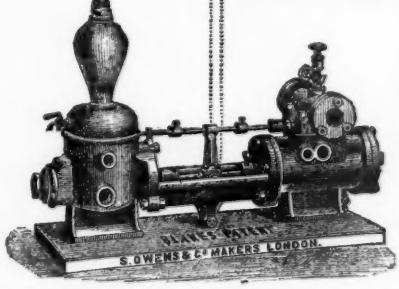
TABLE GLASS OF ALL KINDS.
CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.


THE HORSELEY COMPANY,
LIMITED,
TIPTON, STAFFORDSHIRE.
LONDON OFFICE:
6, WESTMINSTER CHAMBERS, VICTORIA STREET,
GAS ENGINEERS, IRONFOUNDERS, &c.,
MANUFACTURERS OF
GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED LAMP-POSTS, PIPES,
AND ALL REQUISITES FOR EITHER
GAS OR WATER WORKS;
ALSO
MAKERS OF ROOFS, BRIDGES, &c.

S. OWENS & CO.,
WHITEFRIARS STREET, LONDON, E.C,
HYDRAULIC ENGINEERS,
AND MANUFACTURERS OF
PUMPING MACHINERY of every Description.
SOLE LICENSEES AND MANUFACTURERS FOR GREAT BRITAIN OF
BLAKE'S PATENT STEAM-PUMPS,
More than 10,000 in use,
ESPECIALLY ADAPTED FOR USE IN GAS AND CHEMICAL WORKS, FOR PUMPING TAR, WATER, AMMONIACAL LIQUOR, ACIDS, &c.
The following are some of the prominent advantages of the BLAKE PUMP:—

It will start at any point of stroke.
It has no dead point.
It works fast or slow, with the same certainty of action.
It is economical. Has a lead on the slide-valve.
It is compact and durable.



It is interchangeable in all its working parts.
It will deliver more water than any other pump.
It is made of best materials in the most workmanlike manner.
Can be worked at 20 strokes per hour, or 200 strokes per minute.

This Illustration represents Boiler-Feed Pumps, Sizes Nos. 1, 2, and 3, with Hand Lever for working Pump when Steam is not available.

SOLE MANUFACTURERS OF
MANN & OWENS
IMPROVED PATENT GAS-VALVES.
PRICED LISTS AND FULL PARTICULARS FURNISHED ON APPLICATION.

TANGYE BROTHERS AND HOLMAN,

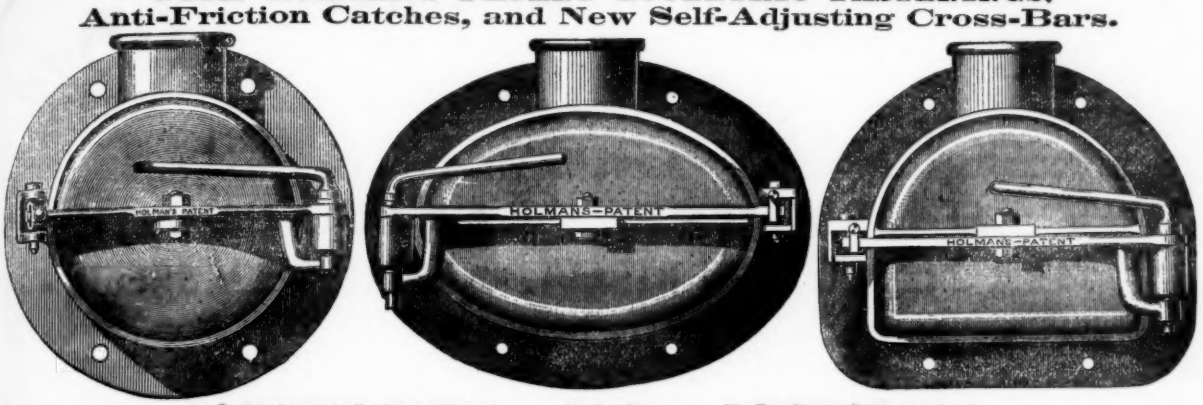
CORNWALL HOUSE, 35, VICTORIA ST., LONDON, E.C.

(LATE OF 10, LAURENCE POUNTNEY LANE.)

SOLE MAKERS OF MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH HOLMAN'S PATENT ECCENTRIC FASTENINGS.

Anti-Friction Catches, and New Self-Adjusting Cross-Bars.



Instantaneous Sealing effected. No Luting. No Duplicate Lids required.

Holman's New Self-Sustaining Cross-Bar ensures freedom of Joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested, being now in use in nearly all the principal Gas-Works in London and the Provinces.

T. B. and H. are now making the "Morton's Self-Sealing Lid" of the SAME FORM OR SECTION AS THE RETORT (see Illustrations above), as well as bringing the Mouthpiece from the D or Oval at back to Circular in front, as heretofore.

D and Oval Morton's Lids are working satisfactorily both in this country, on the Continent, and in the United States of America. Among others they have been adopted by the following Gas-Works:—

The Gaslight Company's Works, Fulham; Ditto, Bromley-by-Bow; Ditto, King's Cross; Ditto, Shoreditch.
And also in the Gas-Works at Richmond, Maidstone, Gloucester, Glasgow, Portsea, Roubaix (France), The Hague (Holland).

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dursley, Exeter, Guernsey, Halesowen, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1875.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

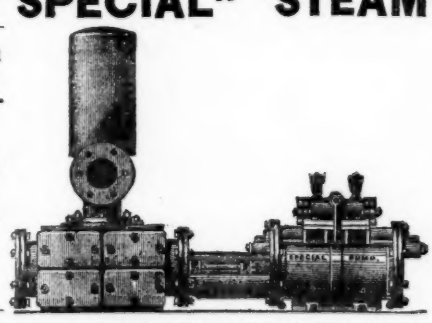
Yours truly,

(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION.

THE "SPECIAL" STEAM-PUMP.

Diameter of Steam Cylinder.	Diameter of Water Cylinder.	Length of Stroke.	Gallons of Water per Hour, Approximate.	Reduced Prices.
3	1½	9	450	£16
4	2	9	815	18
5*	2½	12	1,250*	20
5*	3	12	1,830*	22 10
4	4	12	3,250	25
6*	4	12	3,250*	30
5	5	12	5,070	32 10
7*	5	12	5,070*	40
6	6	12	7,330	40
8*	6	12	7,330*	50
7	7	12	9,750	50
10*	7	12	9,750*	65



In use in a Hundred Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

Messrs. Burt, Boulton, and Haywood, Manufacturing Chemists, have over FORTY "Special" Steam-Pumps in use at their several large Tar-Works.

Two Hundred Sizes made. Those in Table opposite are the leading Sizes for use in Gas-Works and Chemical Works.

* These Sizes being usually selected for pumping Tar and Liquor, are always in stock, or nearly ready, fitted with all pump details in iron, and extra length distance-piece between steam and pump cylinder, at a small extra cost.

TANGYE'S HIGH-PRESSURE AND CONDENSING STEAM-ENGINES; CORNISH, VERTICAL, & TUBULAR BOILERS
HYDRAULIC AND SCREW LIFTING-JACKS, CRABS, PULLEY-BLOCKS, &c.

FULL PARTICULARS, ESTIMATES, CATALOGUES, ETC., ON APPLICATION.

London, 1851 New York, 1853. Paris, 1855. London, 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

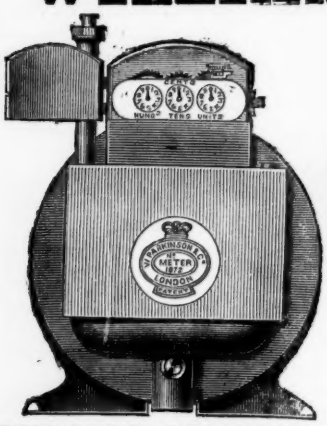
214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON AND CO.,



(ESTABLISHED 1816,)

MANUFACTURERS OF

WET & DRY METERS,

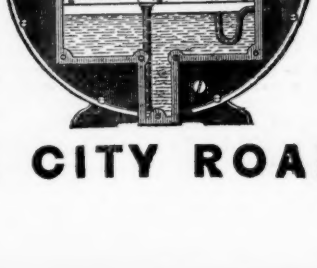
STATION-METERS & GOVERNORS,

EXHAUSTER REGULATORS,

PRESSURE REGISTERS, EXPERIMENTAL APPARATUS, GAUGES, WATER-METERS, &c.

HUNT'S PATENT IMPROVED COMPENSATING METER.

In this Meter, the action of the measuring-drum is reversed. By this arrangement an improvement is effected in the registration at high speeds, which, in many tests, has not varied from the smallest light to three times the capacity of the meter. It works equally well under all pressures. The range of error between the high and low line is much smaller than that allowed by the "Sale of Gas Act."



The Meter has been critically tested, and most favourably reported upon by official Meter Inspectors in London and Birmingham.

W. PARKINSON and CO. have made arrangements for the manufacture of these Meters, both in tin and cast-iron cases, and for the alteration of old ones to this principle, which is confidently recommended as possessing every quality that can be desired by Gas Companies, Corporations, or Private Consumers.

COTTAGE LANE, CITY ROAD, LONDON, E.C.

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, FEBRUARY 19, 1878.

Circular to Gas Companies.

THE great event of the past week, as concerns our industry, was, of course, the half-yearly meeting of The Gaslight and Coke Company. To this vast undertaking every one turns with constantly increasing interest. It is the largest gas concern in the world, and, regarded from any point of view, it must be looked at with something like wonder. Having given, last week, an analysis of the accounts, we need only to-day follow the Governor through his admirable epitome of the state of affairs. First, let us state that we look with some regret on his reference to the proceedings taken by the Metropolitan Board of Works. Those proceedings, in our opinion, should have been dismissed with utter contempt. The fine was of no consequence whatever; but what we may fairly call the insult to the Company, was gross. There is, probably, no other corporate body in the world who would have behaved like the Metropolitan Board. We do not, for the moment, trouble ourselves about the cause of the deficiency of illuminating power (it was probably occasioned by a sudden deposition of naphthaline); but we may repeat here the statement of the Governor, verified, of course, by the reports of the Official Gas Examiner, that for seven years the Company have supplied gas considerably in excess of, and of a quality far superior to, that required by statute. That the Company should be prosecuted for one day's default, can only be quoted as an example of malignity. And yet we are sorry that the Governor of the Chartered Company referred to it at so much length; it was treating the Board with too much honour.

We commended last week the policy of the Directors in carrying forward a large balance, instead of paying an increased dividend. The justice of this policy is well explained in the Governor's speech. In the course of the next two years the convertible five per cent. shares will, if the proprietors choose, become entitled to ten per cent., and this will naturally absorb an increased amount of profits. We mentioned a fact which came to our ears, that a section of Shareholders, whose motto, perhaps, is "*Carpe diem*," would have preferred an enhanced dividend; but the course which the Directors have pursued is infinitely preferable, and more just to the general body of Shareholders. The addition to the reserve-fund was, we may say, made of necessity, and it is only to be regretted that the law does not allow of larger annual contributions to it. Before the sliding scale was enacted, it might have been well to fix a limit to the amount of profit which should be carried to the reserve-fund; but, under present circumstances, no restrictions are necessary, and as the Company have the legal right to an unlimited reserve, the annual contribution to it might have been unlimited also. We need hardly say that we entirely endorse the policy of the Directors.

By a rather violent transition, the Governor immediately passes on to a consideration of the charges which have been brought against the Company, of nuisance at the Bromley works, and gives us the satisfactory announcement that a method has been discovered of treating foul lime, so that it may not be a source of *désagrément*. It has been repeatedly shown in our pages that foul lime need not be a nuisance for one moment, and, further, that it may be revivified for repeated use. The Governor hopes that the use of lime in purification may soon be entirely abolished. We share his wishes, but cannot for the moment share his hopes. Rumours of new methods of purification, which will reduce the amount of sulphur to almost nothing, have reached our ears for months past, but the process is a mystery. We do not believe in mysteries. There is, we understand, a patent concerned, and, no matter who the patentee may be, we have an equal objection to secret processes. The Governor, very properly, dilates on the expenses incurred by the Company in disputing Mr. Patterson's patent rights. We shall not here add anything to what we have said with regard to Mr. Patterson's alleged discoveries, but may express a fervent hope that, somehow or other, a more effectual method of purification than that gentleman proposed may have been stumbled upon. One thing is gratifying, and that is that the Company seem to have become alive to the fact that sulphur is an obnoxious ingredient in gas; and, further, that its removal is not a difficult matter. Let them continue the course they have begun, and we care not how the result is effected, so long as the sulphur is removed as much as possible.

When referring last week to the reduced cost of purification, we remarked that we should be glad to know how the saving had been effected. We learn now that it has arisen mainly from two causes—first, from the fact that the Company manufacture their own lime at Beckton, not only for that, but also for some of their other stations; and, secondly, from the circumstance that spent oxide, as is well known, has realized a higher price during the period over which the present accounts extend.

The interest which the Governor takes in the affairs of the Company is well illustrated by his visit to Paris to see the electric light. Unless we are misinformed, he might have seen better and cheaper electric lights in England. The light he saw in Paris, produced by a rapid succession of sparks, is, we believe, even more expensive than Jablochkoff's candle, although, perhaps, more regularly sustained. Unless we are mistaken, it involves the use of a powerful Rhumkorff coil, and for that reason is less adapted for domestic lighting than the carbon candles, which have been used by other inventors.

We went so fully last week into the working of the Company, that we have nothing to add now but another complimentary remark on the management. It is perfectly clear that the Company are excellently well served by their officers, and this good management, combined with favourable coal contracts, will make the Company a mine of wealth. Supposing everything to go well, within three years the sliding scale may be brought into operation in favour of the Shareholders. The electric light is at present a phantom, and we may safely predict that, under the present condition of the commercial world, the Chartered Company's shares will go on increasing in value. The announcement is made that the Directors are about to raise, by the creation and issue of debenture stock, the sum of £125,000 at four per cent. This, we believe, exhausts the borrowing powers of the Company up to the Act of 1876. The issue will, no doubt, attract the attention of the Proprietors, for it is hard to gain in these days four per cent. interest for capital. When the new share capital authorized by the Act of 1876 is offered by public auction (unjust as we may think the proceeding to be), we venture to think that the interest of existing Shareholders will be so far protected that no doubts can be had as to the security of their profits. They may be a little reduced, but, supposing the condition of things in the commercial world to remain as they are, the reduction will be but small; that is to say, nothing more than four and three-quarters per cent. can be expected. Happy, indeed, are the possessors of original shares in Gas Companies.

We have so often recommended the Chartered Company to work up their own residual products, that we are quite prepared to encounter, in our irresponsible way, any opposition to the scheme. That the Company will profit in the long run there can be no doubt whatever. We shall be extremely sorry if the works of the Company in the least detract from the profits of private manufacturers; but we, as circumstanced, are bound to consider as pre-eminent the interests of Gas Companies. They are well able, however, to take care of themselves, and we need not waste further space in their support. The Governor is per-

fectly correct in characterizing the Beckton works as at present the finest in the world. We need not speak of the past. The future of the Chartered Company is so well assured, that we do not hesitate to recommend the Shareholders to adhere strictly to their securities.

The London Gaslight Company have arrived at the sensible decision to discontinue, at the end of the present half year, the supply of cannel gas. The demand they have for it is but small, and what they distribute has been for years bought in bulk.

The Town Council of Warrington are congratulating themselves on the purchase of the gas undertaking. They expect to make £3000 this year—that is, they intend to plunder the consumers to that extent. It is no new thing in these columns to offer an opinion, that Municipal commercial undertakings should be simply self-remunerative. If the gas consumers of Warrington care to pay extra taxes, we have no objection to make; but they ought fully to understand, that every penny they pay for gas beyond what is required to meet the interest on the debt incurred by the Corporation, and the cost of manufacture and distribution, is, we will not say robbery, but something very like it.

The Peterborough Gas Company maintain their ground, and are happily in a very prosperous condition. Nobody assails them now, and they have a fair prospect before them. In the last half year they carbonized 2434 tons of coal, and got from it 25,769,000 cubic feet of gas, which is equivalent to 10,580 cubic feet per ton—a most excellent result. Of this quantity, 22,990,000 cubic feet were sold, the difference being equal to only ten and a half per cent. loss, which, considering the condition of Peterborough, is remarkable. The loss is less by two per cent. than in the preceding year. Wages, too, have been reduced to a considerable extent, and, altogether, it must be estimated that the works are in a most flourishing condition.

The Annual Meeting of the Cork Gas Company was held on the 11th inst. The Company have had a fair year's working. They are able to pay a dividend of eight per cent. for the last year, and also one per cent. for arrears, to make up for losses during the disastrous period of 1873. The Company are rapidly reducing their price, and the reduction effected this year will give the consumers the benefit of £2000. Our readers may be certain that nothing will be wanted to make the Cork Gas Company a very successful undertaking. The demands upon our space to-day oblige us to defer the publication of the report and accounts until next week.

We have lately had occasion to refer to many reductions in the price of gas, and now we have to mention an advance. The Dawley Gas Company have added tenpence per thousand to their charge, and have thereby excited the lively animosity of their customers, a number of whom have signed an agreement to cease consuming gas until the price is reduced. Perhaps the Directors may think it worth while to consult the wishes of the Consumers as well as the interest of the Shareholders, and, as the former propose, split the difference.

A meeting of Ratepayers of Exeter, convened in accordance with the provisions of the Borough Funds Act, has sanctioned the opposition of the Corporation to the Bill of the Exeter Gas Company. It is clear that the Exeter people are a saving class, for a resolution was afterwards put and carried, that negotiations should be opened with the Company to see if clauses could not be settled in Exeter, so as to save the expense of sending the Mayor, one or two Aldermen, the Town Clerk, and the City Solicitor, to London for a week's holiday at the public cost.

Water and Sanitary Notes.

THE wire-pullers have been at work, but why they should have made a puppet of H.R.H. the Prince of Wales, we fail to conjecture. That the water supply of the country, and especially in rural districts, requires improvement, there can be no doubt; but how it can be improved by a three or four days discussion in the Adelphi, is not clear. Nothing, we rather think, ever did come of a flood of talk emitted in that locality. The quacks meet once more, ventilate their opinions, have them printed in the Society's *Journal*, which, as a rule, is consigned to the waste paper basket, and all is over. Nevertheless, we confess that something will soon have to be done. The water resources of this country may be said to be largely in excess of the requirements of the population, but they need to be properly administered, which they are not at present. If, as His Royal Highness suggests, a large and comprehensive scheme of a national character, adapted to the varying specialities and wants of districts, could be concocted and carried out, it might be that some good would be done. The intervention of the State in the matter, however, is out of the question; and local jealousies will naturally interfere to prevent the appropriation of local sources for the benefit of outsiders. We see this in the opposition now being made, by the millowners and others in the chalk districts around London, to the proposition of the Metropolitan Board of Works. In a modified form, we see it also in the conduct of those who oppose the Thirlmere Scheme of the Manchester Corporation. What ideas prompted the letter dictated to the Prince of Wales, we have no means of knowing. Most probably, the only thought was to get up some talk to sustain the waning popularity of the Society of Arts.

The Manchester Corporation Water Bill has been read a second time in the House of Commons, and referred to a hybrid Committee, consisting of nine Members. The opposition to the measure, all must admit, was weak in the extreme, and but for the intervention of the Government, the second reading would probably have been carried triumphantly, and the Bill, as a matter of course, would have gone to a Select Committee. We do not, however, much regret the result which has been arrived at. The more the question is looked into, and the wider the view taken of it, the more convinced are we that the claims of Manchester, and other large towns in the North, to the waters contained in the natural reservoirs of the Lakes will be admitted. How far a wider appropriation may be made will be matter which this Committee may justly consider. We do not wish to see the water brought to London, for we confess we dislike it. We greatly prefer unsoftened chalk water, and, still more, the softer supply obtained from the Thames and Lea; but the water quacks are very active, and what with the investigations by this Committee, and the babble at the Society of Arts, we shall have enough to listen to on the water question for the next few months.

Dr. Frankland is greatly exerting himself to back up the chalk water scheme of the Metropolitan Board of Works. His quixotic attempt is not likely to meet with any success. His reiterated statement that water which does nobody any harm is quite unfit for dietetic purposes, now only excites laughter. The assertion did once produce alarm, but, like the cry of "Wolf, wolf!" when that ugly quadruped was absent, the statement has ceased to create any sensation. The fact is recognized, that people can continue to drink Thames and Lea waters and live, and the drinkers of Kent and Tottenham waters die just as fast as their neighbours—in one case, indeed, rather faster.

The Metropolitan Board, the majority of whom decline to be regarded as Vestry delegates, nevertheless pretend to act for the Vestries, and in the water dispute now going on they are endeavouring to deprive their constituents of *locus standi* in Parliament, in opposition to their schemes. Whether they can maintain their position or not remains to be seen, for the Vestries are preparing to stoutly contest the question. An important meeting of the representatives of Vestries met at St. Pancras on Friday last, and resolved to maintain the rights of the Vestries to be heard against the schemes of the Board. A great mistake has been made, and we think we discern the beginning of the end of the Metropolitan Board of Works. It is now made clear that they have not the confidence of the public, and without that their existence cannot be prolonged. The misfortune is that we have now no municipal statesman—no one with skill and energy to work into order the chaos of Metropolitan Local Authorities.

CONSUMPTION OF GAS IN LONDON.—During the year 1877, The Gaslight and Coke Company, who supply three-fourths of the Metropolitan area north of the Thames, manufactured 10,728,272 thousand feet of gas, a quantity sufficient to keep one street-lamp, consuming 5 cubic feet per hour, burning day and night for 244,938 years.

SOUTHERN DISTRICT ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—The annual general meeting was held on Thursday last, the report of which will appear in our next.

BIRMINGHAM WATER SUPPLY.—Dr. Hill, the Medical Officer of Health for Birmingham, reports that the water supplied to the town during January was clear. The organic nitrogen, though higher than it had been for the last ten months, was lower than in the corresponding month of last year.

GAS AFFAIRS IN BARBADOES.—The *Barbadoes Globe* of the 24th of December last gives a long account of the Agricultural Society's Industrial Exhibition at Bridge Town, refers to "a display of gas-stoves and cooking apparatus," and to "samples of manures manufactured from the refuse of gas-works." "Within the bar (of the Court House), which was erected in one of the deserted cells, a gas-stove was at work furnishing the means of supplying hot joints and other material for luncheon." In the list of prizes awarded by the Council of the Society, we find that Mr. R. K. Moorhouse, the Resident Engineer of the Gas Company, received a prize of 15 dols. for "Exhibition of gas-stoves and specimens of sulphate of ammonia." The *Globe* of the 28th of December contains a letter from Mr. W. Drumm, Analytical Chemist, addressed to Mr. Moorhouse, in which he says: "I have pleasure in stating to you for the Directors, that *all* my testings, from July down to date, have shown for your credit a pure gas, *always* free from ammonia and sulphur, or its compounds, and invariably of high illuminating power, as judged by comparison of light, &c. I have in *no* instance detected the slightest trace of chemical impurities since my last report, and believe the public are satisfied that gas can be and is supplied to this city of full power and purity beyond any question."

WATER BILLS FOR 1878.

(*Continued from page* 228.)

The *Nottingham Improvement Bill*, before alluded to, provides for the purchase of the Water-Works by the Corporation; but we believe there is some hitch in the matter.

The *Nottingham Water-Works Bill* is to extend the limits of the Nottingham Water-Works Company, and to authorize them to raise additional capital to the extent of £150,000, carrying the usual borrowing powers.

The *Scarborough Water-Works Bill*, and the *Scarborough Corporation Water-Works Bill*, are two competing measures relating, as a matter of course, to the water supply of Scarborough. As we announced last week, the two contending parties have arrived at an amicable settlement for the transfer of the works to the Corporation, and no notice of these measures is required. We have not yet learned the terms of purchase, but we may remark that the expended capital of the Company is £65,000, and they have borrowed £17,100, all of which has been expended. The Corporation, by their Bill, seek power to raise £250,000, which looks as though very satisfactory terms of purchase have been made. There is not, perhaps, a more promising undertaking in the kingdom, and the Corporation should deal liberally with the Company.

The *Sevenoaks Water Bill* is to dissolve and re-incorporate, with statutory powers, the Sevenoaks Water-Works Company. The original capital of the Company was £12,000, and they have borrowed £2500, and the estimated value of the Company is now £16,000, a sum it is intended to convert into stock. The Bill further proposes to raise additional capital to the amount of £12,000, making the total capital £28,000.

The *South Hants Water-Works Bill* is to extend the limits of the South Hants Water-Works Company, incorporated in 1876 for the supply of Romsey and the surrounding districts. The capital sanctioned in 1876 was £50,000, with the usual power to borrow. This Bill proposes to raise additional capital to the amount of £30,000, with the ordinary borrowing power.

The *South London* (*Spring*) *Water Bill* looks very much like a filibustering measure, designed to damage the interests mainly of the Southwark and Vauxhall Company. It has no chance of success, and may here be dismissed with contempt. The interested promoters may pay their parliamentary expenses, and look as pleasant as they can. Their design is, if they can get parliamentary permission, to supply "pure spring water" to a large district lying between Penge and Esher. The modest capital of £300,000 is asked for. At this day it is difficult to find a profitable investment, and supposing this Bill should pass into an Act—a very improbable contingency—people who put their money in the undertaking must take their chance. The promoters are the owners of a well and springs at Streatham, of the capacity of which we know nothing.

The *Southport Water-Works Bill* is to extend the limits of the Southport Water-Works Company, and to enable them to raise additional capital. The present capital of the Company is £150,000, all of which has been raised and expended, and their borrowing powers have been fully exercised. Naturally, in a growing place like Southport, the water-works require extension, and the Company having acquired land for new works desire to raise additional capital for their construction. The amount they propose in this Bill is £200,000, carrying the usual borrowing power. The dividend on the new capital is seven or six per cent., according as it is raised by ordinary or preference shares. The Company ask the very reasonable power to charge the whole rateable value when any part of premises is supplied with water.

The *South Staffordshire Water-Works Bill* is to enable the Company to raise further capital, in order to supply the necessities of their extensive district. It will have been seen that an arrangement has been proposed, under which the Company will be enabled to lease a portion of their undertaking to the Police Commissioners of Burton-upon-Trent.

The *Stone Water Bill* is to incorporate a new Company formed to supply water to Stone, Meaford, and Oulton, and a few surrounding parishes. The capital proposed for the Company is £10,000, with the usual borrowing power. Authority is asked to charge the usual rates and extras.

The *Trowbridge Water Bill* is to extend the limits of the Trowbridge Water Company, and to enable them to construct additional works. The capital of the Company is £40,000, all of which has been raised and expended, and they have borrowed to the usual extent. By this Bill they seek power to raise additional capital to the amount of £30,000, and to borrow to the extent of one-fourth that sum. The profits of the Company are to be limited to seven or six per cent., according as the capital is raised by ordinary or preference shares.

The *Truro Water Bill* is to extend the time for the completion of water-works by the Truro Water Company.

The *Warrington Water-Works Bill* is to extend the limits of the Warrington Water-Works Company, and to enable them to raise further capital. The present capital of the Company is £75,000, all of which has been raised and expended. Under the provisions of this Bill the Company propose to raise additional capital to the amount of £160,000, with the usual borrowing powers.

The *Waterford Corporation Water and Improvement Bill* is to authorize the Corporation of Waterford to raise £15,000 for the completion of their water-works. The Corporation do not appear to have been successful in the management of their water undertaking, for by this Bill they seek power to levy water-rates, which, so far as we can see, have no limits.

The *West Houghton Local Board Bill* is to authorize the Local Authority of the district to construct water-works. As our readers know, the Board have just purchased the undertaking of the West Houghton Gas Company. The estimated cost of the water-works is £29,845, and the Local Board seek power to borrow £35,000. The rates proposed to be charged are as usual.

The *Weston-super-Mare Improvement Commissioners* (*Water Supply*) *Bill* is to authorize the Commissioners to purchase the undertaking of the Weston-super-Mare Water-Works Company, and to obtain extended limits. The expended capital of the Company is £22,350, and the consideration for the purchase is to be £65,000. The Commissioners seek power to borrow £90,000. The Bill is intended to authorize the Commissioners to charge considerably higher rates than those usually charged by Water Companies.

The *Whitehaven Union Water-Works Bill* is to authorize the Local Authority of the district to construct water-works at an estimated cost of £35,780. Power is sought to borrow £40,000. The Authorities propose to charge exactly the same rates that Companies usually do.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

CLVIII.

PUBLIC LIGHTING (*continued*).

The ordinary rectangular shaped lamp, 14 inches square at the widest part, notwithstanding its faults, is the most useful and economical shape that can be adopted for general use. It has the advantage over all others in first cost, and it is easily cleaned and repaired.

The plan which is occasionally adopted of filling the upper part of the lamp with porcelain or other opaque substance, intended to reflect the light downwards, is a retrograde step, and is not to be recommended except under special circumstances. The first gas-lamps used were so constructed, and afterwards the glazed tops were introduced as an improvement, which they undoubtedly are, over the others. The glass panes, permitting the light to be cast upon the upper fronts of the adjacent buildings, are to be preferred in all respects, as the light which is thus reflected from the walls gives a cheerful appearance to the street; whilst, on the other hand, the opaque tops convey the impression of a gloomy canopy in close proximity overhead, rendered all the more sombre and distressing from the light underneath, which has a most depressing effect upon the mind. These remarks do not apply with equal force to lamps used in the lighting of country roads, although even here the reflecting tops referred to are of questionable utility.

The lanterns or lamps are best made of copper, tinned over. The hole in the bottom frame, to admit of the supply-pipe, should be three-fourths of an inch in diameter. The bottom square should be in two halves—one fixed, the other hinged on the outer edge, for raising and lowering in lighting the burner. These may be glazed in the ordinary way, and the movable half should be provided with stronger glass, and may be protected from damage by the lighting-rod, with copper wires, three-fourths of an inch apart, soldered across the bottom. On no account should the hinged flap be dispensed with, or allowed to remain open, as the flame is thus exposed to the action of the wind, causing it to flicker and oscillate, sacrificing a large proportion of the light, and risking its extinction.

In employing regulators, a carefully constructed lamp is more necessary than where no regulators are used; because the pressure at the point of consumption being reduced to the minimum in order to ensure the maximum amount of light the gas is capable of affording, the jet is more liable to be affected by draughts of wind, causing an unsteady and smoky flame.

The lamp frame should be made as narrow as is compatible with due strength, so as not to intercept the rays of light. The stand or supply pipe may be of three-eighths brass tube, and should be of such length as that the burner therein shall be opposite to the centre of the side panes. The vertical iron service-pipe should be securely wedged or otherwise fastened at the top of the column, to prevent vibration and the loosening of the pipe-joints.

An improved lamp of the ordinary and other patterns is made by Mr. W. Keen, and Messrs. D. Hulett and Co. respectively, dispensing

with the use of putty or other similar material in fixing the glass, which is secured by clips, or by hinged flaps and turn buttons. The chief advantages claimed for these are the immunity from breakage of the glass through frost, expansion, or contraction; the ease with which new squares, to replace broken ones, can be inserted by any inexperienced workman; the capability afforded of removing the glass when the frames require to be painted; and their cheapness and durability. The annexed engraving, fig. 19, shows one of Mr.

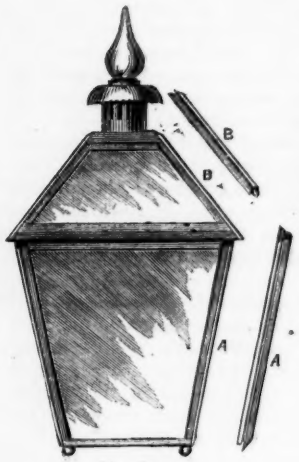

Fig. 19.

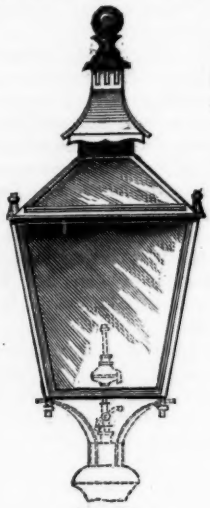

Fig. 20.

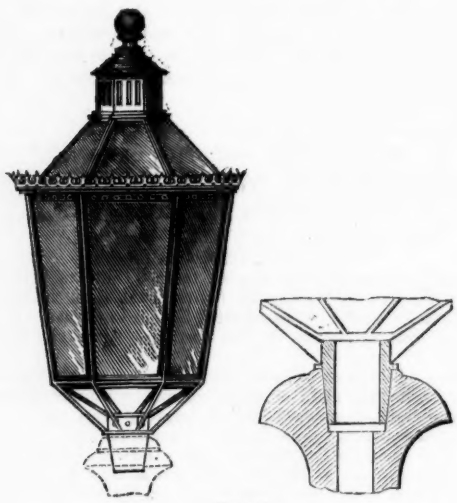

Fig. 21.

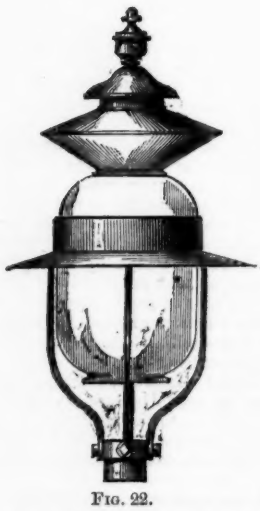

Fig. 22.

Fig. 23.

Keen's double-frame clip-lamps. They are glazed simply by the clips A and B. Different sizes and shapes of lamps, in copper, brass, and tin, are made on the same principle.

The 14-inch lantern, and the hexagonal pattern, called the "Westminster," as made by Mr. Sugg, are shown in figs. 20 and 21. The "Boulevard" (American) lamp is exhibited in fig. 22; and Mr. R. W. Brett's improved lantern, frame, and support, in fig. 23. Each of these has its special merits, which need not be commented on, as they will be readily appreciated on an examination of the several engravings.

The utilization of the light given in street and other lamps has occupied the attention of Mr. T. A. Skelton for a number of years, and his efforts in this direction have been attended with deserved success.

The principle of Skelton's catoptric lamp is in the application of reflectors made of strips of silvered glass fixed in the roof and upper portion of the sides of the lantern, by which much of the light, hitherto dissipated by upward radiation, is bent down and utilized. The direction of the rays of light is by this means controlled, and, besides being better distributed, the rays are projected to such a distance in the direct line that, at a certain interval between the different lamps, the light-giving power of the flame is practically doubled, whilst at a still greater distance it is more than trebled. The effect produced by the use of these lamps upon the pathway has been aptly described as a continuous ribbon of light.

The lamps, as originally made, were fitted with a double set of reflectors—*i.e.*, both on the roof and upper portion of the side panes, but a new pattern has been recently introduced, by which the reflector is applied to the roof only, thus reducing the extra cost of construction to one-half; and arrangements are also made by which the catoptric reflectors can be fitted into the lamps ordinarily in use.

Hitherto the reflectors have been made with silvered glass, the metallic back being protected by a coating of some substance. There was a liability, however, of the silver becoming oxidized on exposure to the air, in case of the failure of the preservative coating. To obviate this, Mr. Skelton has produced a non-oxidisable metallised glass, having a reflective power nearly equal to that of silver, requiring no protection whatever, and of perfect durability.

The metal frames, in which the different groups of reflecting strips are held, are glazed with ordinary glass on both sides, to prevent the entrance of dust and the tarnishing of the mirrors, so that lamps containing the reflectors are as easily cleaned as the ordinary kind. In the event of fracture or derangement of the mirrors, to which, however, they are not easily liable, the case containing them is readily opened, giving access for adjustment or repair. To prevent the glass surfaces from becoming obscured by damp, a perforated zinc cage, filled with lime or other absorbent of moisture, is placed between the glass coverings, and this can easily be removed and recharged at intervals as required.

The effect of the utilisation of light is to render street illumination much more efficient than it has hitherto been, and, as this is accomplished without an increased expenditure for gas, the economy is in proportion to the advantage gained, and far more than compensates for the additional cost of the improved lantern.

(To be continued.)

Correspondence.

[*We do not hold ourselves responsible for the opinions expressed by Correspondents.*]

SUPPLY OF GAS TO PUBLIC LAMPS.

Sir,—Taking up the line of a paper read by me at Bristol, I beg to hand you results of the average meter system, with and without governors, in our town, for the quarters ending—

	Cubic Feet p. Quarter.
Dec. 25, 1877—	
Full-time lamps, with governors at 5 feet.	5,140
Dec. 25, 1876—	
Full-time lamps, without governors.	2,550
	2,590
Dec. 25, 1877—	
Lamps put out at eleven o'clock, with governors	2,290
Dec. 25, 1876—	
Lamps put out at eleven o'clock, without governors.	1,512
	778

Account for gas same time, with governors.	£123 6 6
Account for gas same time, without governors.	69 4 6
	£54 2 0

I must here add that Brönner burners, to pass 4 cubic feet per hour, were in use before the 5 cubic feet governors, this *apparently* making the difference of one foot per hour; but the account fully shows that the loss on the old system must have been great; for, instead of being *paid* for 5 feet per hour as at present, we were only being paid for a little more than 2½, clearly proving that the average meter system without the governor is not just to the suppliers of gas.

Gas-Works, Hertford, Feb. 11, 1878. R. W. Brett.

COMMISSIONS.

Sir,—A well-known Gas Engineer lately said to me that, although he himself refused commissions, he believed many who accept them justify themselves on the ground that their Directors or Committees know that they do so; and he mentioned one case he had heard of, where an applicant for increase of salary had been reminded that he had other means of increasing his income besides his salary.

Can any of your readers say whether it is correct to assume that Directors and Committees generally know of the practice, and approve of this mode of paying for services, otherwise (in too many instances) inadequately remunerated?

If it is the fact that the system is so known and approved, there seems no reason why it should meet with condemnation.

Inquirer.

LIGHTING BY ELECTRICITY.

(*Concluded from page* 193.)

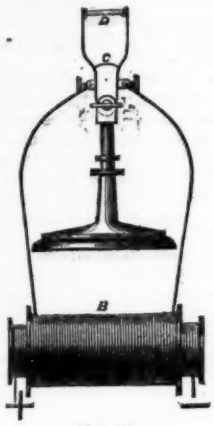

FIG. 18.

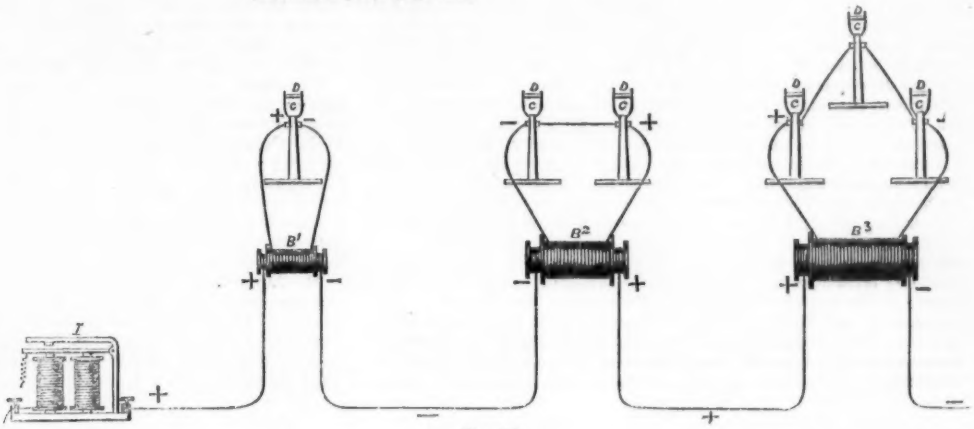

FIG. 19.

The last paragraph which we quoted from M. Fontaine's book, in which he expresses his fervent hope that the inventor of the Electric Candle may be "more fortunate than his predecessors" in giving practicability to the system of electric lighting, refers to one of M. Jablochkoff's latest attempts to solve the divisibility problem, as embodied and described in a patent which he took out in May last for "A New Process of Producing and Dividing Electric Light, and Apparatus therefor."

The only one we shall notice is of the incandescent type, in which, instead of platinum or carbon, he uses a piece of kaolin or porcelain, which, in consequence of the passage of the electric current, becomes incandescent, yielding light, at the same time consuming so slowly that many hours are required for its disappearance. He says:—

In carrying my invention into effect, I establish, in the electric circuit employed, a number of induction coils corresponding to the number of lamps to be employed, the terminals of each inner coil being connected to the said circuit, while the terminals of the outer coil are situated on each side of the slab of the kaolin of the lamp, such slab being held by the same description of vice or holder as described in the before-mentioned patent. In putting the lamp in action, the current of the induction coil is caused, in the first instance, to pass through a kind of conducting match, placed on the surface of the refractory slab. A spark being established along the line of this match, the heating and incandescence of the particles of kaolin along the same line is established, and the kaolin begins to consume away slowly while producing a brilliant light.

As any number of induction-coils may be placed in one and the same circuit, and as the circuit of each coil may be interrupted at several points for the establishment of as many separate lamps, it will be seen that a great number of lamps can be introduced into one and the same primary circuit, each of which can be extinguished or ignited without affecting the action of the others.*

Fig. 18 shows the construction of my improved form of electric lamp. It consists of a vice, C, similar to that described in my previous patent for holding my electric candle, the jaws of the vice holding between them the blade or slab of kaolin or porcelain, D, which, with a width of about three-eighths of an inch, will burn all night. The vice is arranged above an induction coil, B, and may be enclosed by a lamp-glass or globe, the whole being made to resemble an ordinary lamp in appearance. The current from an induction coil, in passing through the slab, D, has not sufficient intensity to melt and burn the kaolin, but heats the same to the point of incandescence. The current is, in the first instance, made to act upon a kind of conducting match placed on the edge of the kaolin slab. The part of the slab which is thus heated forms a conducting line of great resistance, and which, on the passage of a current of high tension, is raised to a white heat, giving out a fine light. A certain consumption of the kaolin is effected along this line of incandescence, but the consumption is very small. The result thus obtained between the terminals of the circuit is a fine luminous band, which can attain a much greater length than the non-luminous spark ordinarily produced by the coil employed. The strength of the light only depends on the number of convolutions and size of the wire employed for the induction coil.

Fig. 19 shows the arrangement of my electric lamps for currents of the same direction, either continuous or reversed, such as are produced by Gramme's machine and ordinary batteries. In this case the induction coils are arranged with interruptor and condensers, either one to each, or, as the drawing shows, one to several coils. The induction coils, B^1, B^2, B^3, are placed near the points where the light is to be produced, the lamps, which consist, as before, of a vice or clamp holding the kaolin slab, can be of different intensities, according to the dimensions of the slab, or preferably according to the number of slabs employed, the induction coils being made of correspondingly different dimensions.

We see that the improvement set forth in the patent just noticed is the obtaining of light by raising some refractory substance, by the electric current, to a white or glowing heat. In this case the current is to be that obtained from the secondary wire of an "induction coil;" consequently, the lighting of a building by this system means, number of lights equal number of coils, *plus* one or more magneto or dynamo electric machines, according to the size of the premises, for exciting the coils. As all the readers of the JOURNAL know well what sort of an instrument the "induction coil" is, they will be able to judge for themselves what are the chances of success of such a complicated system of lighting, and what effect it is likely to have on their industry.

We have endeavoured to show what the electric light is, as used for lighthouses and large spaces, which, for the sake of distinction, we may call the voltaic arc lamp, with regulator. We have also described and illustrated the electric candle of M. Jablochkoff, which is intended (when some adjunct yet wanting has been found) to bring this light nearer home, and we may call it the voltaic arc light, without a regulator.

The notice of Mr. King's patent of 1845 introduces us to another type—the incandescent lamp. This is the prototype of all that class down to M. Fontaine's, of whose lamp we have at present only the likeness, as well as the kaolin lamp of M. Jablochkoff.

We have also called attention to a lamp of another type, first introduced by Mr. Thomas Wright, in 1845. In this the voltaic arc is also the source of light, but instead of carbon points, requiring great attention as regards their renewal, he suggested that carbon discs, revolved by clockwork, should be used, thereby obtaining light at the point where the edges are nearly in contact, and securing a greater duration of carbon material, without replacement. Many attempts have been made with a view to perfect Wright's idea; but in this particular, as in many others already mentioned, every step taken, as far as the lamps are concerned (except for a great centre of light), tends to a confusion of apparatus. Note the following as an illustration of our meaning: The annexed engraving, fig. 20, shows the latest improvement on Wright's invention, and is called the Regnier lamp. This is said to be equal to the supply of a light continuously, without a renewal of carbons, for 24 hours—*i.e.*, supposing all things go well during the time. The discs or circular carbon plates touch nearly at A, and there the voltaic arc manifests itself in the form of what we now call the electric light, by reason of

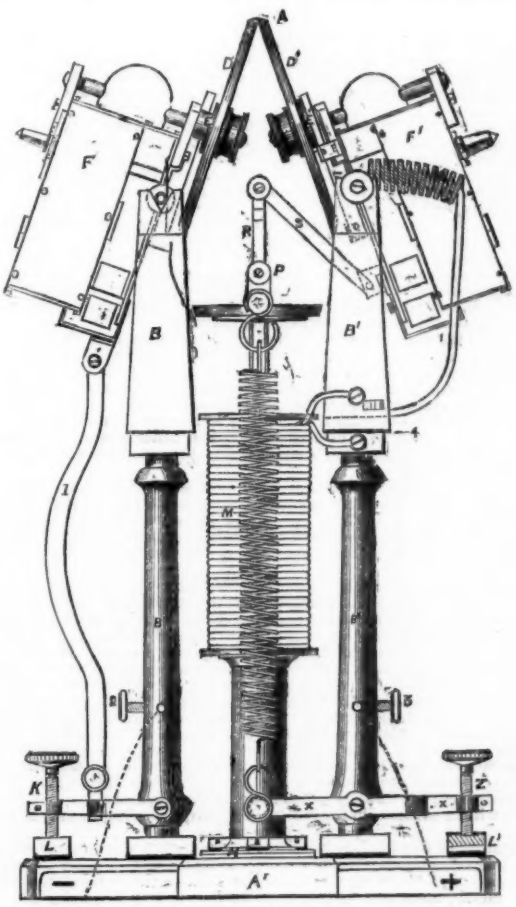

FIG. 20.

* But the same piece of kaolin cannot be relighted for want of the match.—ED. J.G.L.

its action on the carbon, as before explained. A^1 is the base of the instrument, or, rather, machine. B B, B^1 B^1, are standards forked at the upper ends. D D^1, carbon discs, rotated by the clockwork contained in the boxes, F F^1. G G are trunnions on which the discs and the clockwork motors oscillate. H is a forked lever, connected to the clockwork, F, by a curved rod, I. K is a set screw at the end of this lever, the end of which screw rests on the insulated cup, L. By means of this screw, the motor, F, can be moved forwards or backwards, for the purpose of adjusting the carbons. M is a coil in which is suspended a core of soft iron, which we shall see, by and by, acts as a regulator, in a similar manner to that of the regulators we have before heard so much of. The upper or forked part of the standard, B^1, being insulated from the lower part at 4, the current passes up from the binding screw, 3, as far as this; but in order to pass this point to the forked end of the standard, it has to circulate around the wire of the coil, M, from whence it can get to the fork of B^1, and the carbon disc, D^1; cross over to D, down B B, to the binding screw, 2, and from thence to the negative conductor. By causing the current to pass through the coil, M, the soft iron core becomes more or less magnetized, and therefore through the medium of the rod, P, crank, R, and arm, S, increases or diminishes the breach between the two carbons, D and D^1, according as the current is more or less intense. There are springs attached to actuate the motor, F^1, and disc, D^1, in conjunction with the electro-magnet, M. X is a forked lever, to the forked end of which the springs are attached; at the other end is a set screw, Z, resting on the block, L^1. By means of this screw the tension of the springs can be varied, and the lamp regulated. The battery wires are shown by dotted lines, and marked + and −.

The latest patent of M. Jablochkoff, the specification of which follows, is evidently intended by its title to embrace, or, at any rate, to appear to embrace, the substance shadowed forth in the remark by M. Fontaine already mentioned, which, to save trouble of reference, we will quote. He observes, with regard to the many schemes for lighting by electricity, and its division for lighting purposes, which have been patented or suggested from 1845 to the present time: "We believe that for such great efforts to be crowned with success, a new source of electricity would have to be discovered, or some means found of commercially utilizing atmospheric electricity."

M. Jablochkoff's patent, dated Oct. 17, 1877, and from which the accompanying engraving, fig. 21 is copied, is for "A New System of Distributing and Increasing with Atmospheric Electricity Currents proceeding from a Single Source of Electricity, for the purpose of Supplying several Lighting Centres." Let us see how he proceeds to do it:—

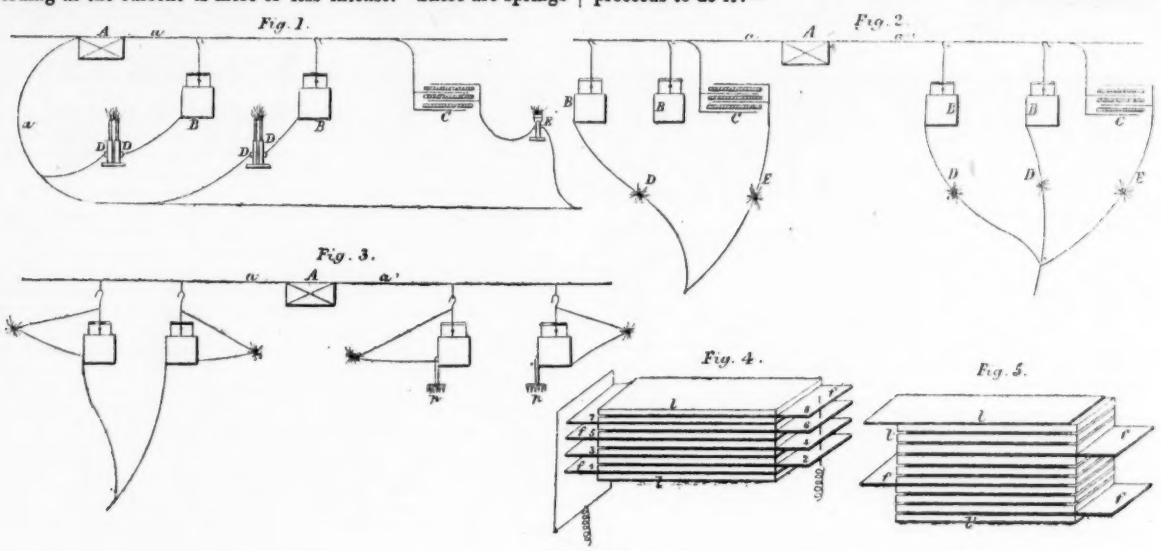

Fig. 21.

My invention has for its object to effect the distribution of electric currents proceeding from a single source of electricity, for the purpose of supplying at the same time a number of illuminating apparatus, and at the same time to strengthen such currents by means of atmospheric electricity.

In order to obtain useful results from a current proceeding from a source of dynamic electricity, instead of operating directly with the said currents, as heretofore, I, according to my present invention, cause the same to undergo a double transformation, by firstly converting the dynamic electricity into statical electricity, and then re-converting this into dynamic electricity, and it is by means of the latter current that I obtain useful results. For the above purpose, instead of closing the circuit of a source of electricity by means of a continuous conductor, as heretofore, I unite the conductor coming from one of the poles of the electrical source with one of the armatures of a condenser, composed of one or more Leyden jars of large surface, or constructed as will be presently described.

The other conductor is connected in various ways, of which the principal ones are shown on the accompanying drawings.

At fig. 1 the one conductor, *a*, proceeding from a magneto-electric machine, A (giving alternating currents), is connected with the interior surfaces of several Leyden jars, B, B, or of the condenser, C, which is of a particular construction. The outer armatures of these condensers are connected to one of the charcoal points, D, of my electric candle, or with one of the ends of the slab of kaolin E (operating as described in the specification to my former patent, No. 1996 of 1877). The other charcoal point, or the other end of the kaolin slab is connected to the second conductor, a^1, of the electric machine.

At fig. 2 the two conductors, *a*, a^1, proceeding from a magneto-electric machine, with alternating currents, are connected to the inner surfaces of the condensers, B, B, C, C. The outer armatures of these conductors are connected with the apparatus for producing light, of which the second charcoal point, D, or the other end of the kaolin slab, E, is connected with earth.

At fig. 3 the two conductors proceeding from the said machine are connected with the interior armatures of the condensers. The outer armatures, at the left hand of the machine A, are connected with earth, while at the right hand they are connected to pointed prongs, *p*, *p*, which allow more readily the escape of the electricity into the air. In this case the illuminating apparatus is placed between the inner and outer armatures.

The interposition of the condensers not only allows the current to be distributed in several directions as I have described; it also has the object of developing atmospheric electricity, and of accumulating it in the condensers, from which it is directed, in the form of currents, to the illuminating apparatus. The total quantity of electricity supplied to these apparatus is, therefore, greater than that supplied by the primitive current, and consequently produces a stronger light than that which the latter would give if led directly to the illuminating apparatus.

It will be evident that this electricity can, according as may be required, be supplied either in quantity or in tension.

Instead of Leyden jars it is more convenient to use as condensers those of the particular construction shown at figs. 4 and 5. That shown at fig. 4 consists of plates or layers of metal, *f*, *f*, separated by insulating slabs, *l*, *l*, the metal plates, Nos. 1, 3, 5, &c., and Nos. 2, 4, 6, &c., being respectively connected with each other. Each set of plates acts as one of the armatures of the Leyden jars.

For obtaining greater tension, the insulating layers are constructed of a number of alternate insulating and conducting leaves or plates, which are not in contact with one another, as shown at fig. 5.

The form of the condensers may be varied, and several may be connected in quantity or in tension.

Having thus described the nature of my invention, and in what manner the same is to be performed, I claim—

1. The above-described method of distributing electric currents proceeding from a single source of electricity, for supplying illuminating apparatus, by first converting a current of dynamic electricity into statical electricity, and then re-converting it into dynamic electricity, which is conveyed to the illuminating apparatus.
2. The method of strengthening electric currents such as are referred to in the preceding claim by means of currents of atmospheric electricity, substantially as herein described.

Our readers, if they can discover nothing new, will soon recognize the old "Leyden jar" and M. Fizeau's "condenser," so much recommended, and generally placed in a cavity in the base of large induction coils. They may perhaps also be able to discover in what way M. Jablochkoff will be able to help himself from the great stock of atmospheric electricity, or how, from anything set forth in this specification, he manifests knowledge other than was possessed by the electricians of 1745. We cannot.

We have now completed the object with which we started, which was to give those of our readers who are curious on the subject the best account in our power of the means for producing the electric light, and what we consider the most intelligent speculations as to the probability of its becoming, at some time or other, a competitor with gas. In doing so we have, as far as possible, allowed discoverers and authors to speak for themselves. The volume of M. Hippolyte Fontaine, from which we have liberally quoted, gives a very interesting historical *résumé* of the efforts made by different inventors since the days of Mr. King, in 1845, to divide a stream of electricity in order to furnish several lights. We feel bound to say that these efforts have not been crowned with success, therefore the application of electricity for illuminating purposes is still greatly restricted. For public places and the illumination of large halls there may be a possible future for the electric light; but for illumination, in the ordinary sense, there can, as far as we can see, be none. Our readers will, however, draw their own conclusions from the descriptions we have given. All we can say is, let those who are so fortunate as to possess them, stick to their shares in the gas undertakings. Gas, as we have many times said, will last our time. We shall rejoice at any scientific progress made; but the instances in which advances of knowledge have destroyed an industry are exceedingly few, and, supposing the worst to happen, it will be a century or two before gas is replaced by electricity.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, FEB. 11.

The Examiners reported that the further Standing Orders applicable to the York United Gas Bill have been complied with.

Bills read a second time:—Bedlington Local Board (Water); Castleford Local Board; Mansfield Commissioners Gas; Normanton Gas; York United Gas.

Petitions against the following Bills were presented:—Forfar Water, from (1) Caledonian Railway Company, (2) Manufacturers and traders in Forfar, John Lowson and Son, and others; Normanton Gas, from Henry Briggs, Son, and Co.; Warington Water, from Trustees of the River Weaver Navigation.

TUESDAY, FEB. 12.

Bill read a second time:—South Staffordshire Water.

Petitions were presented against the Exeter Corporation Water Bill, from (1) Great Western and South Devon Railway Companies, (2) Exeter Water Company, (3) Topsham, Woodbury, and Lympstone Water-Works Company; and against the Warrington Water Bill, from (1) Rev. Sir G. C. Schiffner, Bart., and Lady Shiffner, (2) Newton-in-Mackerfield Improvement Commissioners.

THURSDAY, FEB. 14.

The Examiners reported that the further Standing Orders applicable to the Lichfield Gas and Trowbridge Water Bills have been complied with.

Bills read a second time:—Burton-upon-Trent Improvement Commissioners; Trowbridge Water.

Petitions against the following Bills were presented:—Castleford and Whitwood Gas, from (1) Lancashire and Yorkshire, and North-Eastern Railway Companies, (2) Ackworth, Featherstone, Purston, and Sharlston Gas Company, Limited, (3) Methley Local Board; Castleford Local Board, from (1) Whitwood Local Board, (2) Methley Local Board; Normanton Gas, from (1) Midland, Lancashire and Yorkshire, and North-Eastern Railway Companies, (2) Normanton Local Board, (3) Whitwood Local Board of Health; Warrington Water, from (1) Black Sluice Commissioners, (2) John Tattersall Cunliffe, (3) Samuel Beckett Chadwick, (4) Arthur Hugh Smith Barry; York United Gas, from (1) Corporation of York, (2) Trustees of York County Hospital.

FRIDAY, FEB. 15.

Bill read a second time:—Lichfield Gas.

Petitions against the following Bills were presented:—Castleford and Whitwood Gas, from (1) Normanton Gas and Water Company, Limited, (2) Whitwood Local Board, (3) W. J. and B. Mitchell; Exeter Gas, from Corporation of Exeter; Trowbridge Water, from Great Western Railway Company; Warrington Water, from (1) London and North-Western Railway Company, (2) Corporation of Warrington, (3) John F. Marsh, (4) J. and C. Hutchings.

HOUSE OF COMMONS.

MONDAY, FEB. 11.

The Examiners reported that Standing Order 62 has been complied with in the case of the following Bills:—Cleveland Gas; Farnworth and Kearsley Gas; Shrewsbury Gas; Torquay Gas: and that Standing Order 63 has been complied with in the case of the East Grinstead Gas and Water Bill.

Bill read the first time, and ordered for second reading:—Drumcondra, Clonliffe, and Glasnevin Township.

Bills read a second time and committed:—Bangor Water and Gas; Cheltenham Corporation Water; Durham Water; Grand Junction Water; Hartlepool Gas and Water; Maryport Improvement; Nottingham Improvement, Gas, and Water; Scarborough Corporation Water; Scarborough Water; Sevenoaks Water; Tredegar Water and Gas.

Petitions in favour of the Manchester Corporation Water Bill were presented, from (1) Keswick Local Board, (2) Penrith Local Board, (3) Owners, &c., of houses and land at Windermere, &c., (4) Owners, &c., in Keswick, (5) Owners, &c., in Underskiddaw, &c., (6) Owners, &c., of Penrith, (7) Owners, &c., of Grasmere, (8) Landowners, &c., of Wythburn, &c., (9) Inhabitants, &c., of Ings and Staveley, (10) Hotel-keepers in the Lake District.

Petitions against the following Bills were presented:—Farnworth and Kearsley Gas, from (1) James Berry, (2) Farnworth Local Board, (3) London and North-Western Railway Company; Hamilton Burgh, from (1) Owners, &c., within Burgh of Hamilton and district proposed to be added, (2) Duke of Hamiliton, (3) Commissioner of Supply of the county of Lanark, (4) John Urquhart, (5) John Cooper, (6) Bent Colliery Company, Limited, and others; Newbury Borough Extension, from Owners, &c., of lands and houses in Greenham; South Hants Water, from Inhabitants of district of South Stoneham Rural Sanitary Authority; Tredegar Water and Gas, from (1) Ebbw Vale Local Board, (2) Ebbw Vale Steel, Iron, and Coal Company, Limited.

A petition against the Manchester Corporation Water Bill (the petitioners not praying to be heard) was presented from Members of the University of Cambridge.

TUESDAY, FEB. 12.

The Examiners reported that Standing Order 62 has been complied with in the case of the Bournemouth Gas and Water, and the Southport Water Bills; and that Standing Order 63 has been complied with in the case of the Hemel Hempsted District Gas Bill.

Bills read a second time and committed:—Lewes Gas; Manchester Corporation Water; South Hants Water; West Houghton Local Board.

Petitions were presented against the following Bills:—Bangor Water and Gas, from London and North-Western Railway; Manchester Corporation Water, from Owners or occupiers of land in St. John's, Castlerigg, and Wythburn; Newbury Borough Extension, from Speenhamland Improvement Commissioners; Southport Water, from Corporation of Southport; Tredegar Water and Gas, from London and North-Western Railway; Weston-super-Mare Improvement Commissioners, from Great Western Railway Company.

A petition was presented from the Corporation of Southport for dispensing with Standing Order 129 in the case of their petition against the Southport Water Bill.

MANCHESTER CORPORATION WATER BILL.

THE THIRLMERE SCHEME.

On the motion for the second reading of this Bill,

Mr. E. S. HOWARD said: Sir, in rising to move the rejection of this Bill, the first thing I must do is to state the reasons why I feel myself justified in taking this rather unusual course. I can assure the House that I should not have undertaken so great a responsibility if I had not believed the assertion of a very high official authority that the circumstances of the case will justify such a proceeding. The first contention of the promoters of the Bill is, that it would be unprecedented to refuse or to reject a Bill of this kind on the second reading, unless its object is of a novel character, and contrary to public policy or to general law. I do not pretend that the object of the Bill is altogether of a novel character, but I do say that the Bill raises questions which were never raised before, and of such importance, that they cannot be dealt with in the ordinary manner. From time to time there have appeared in the local newspapers in the North, statements that such and such a town—sometimes Newcastle, sometimes Liverpool, and sometimes Manchester—was contemplating a scheme for obtaining a supply of water from one or other of the lakes. Hitherto, all these schemes have come to nothing, and this is the first of the kind that has seriously been brought forward. At first it was thought that there was nothing unreasonable in the proposal. Honourable members are aware that Glasgow is supplied with water from Loch Katrine, and it was naturally thought that, if Manchester was in want of water, and there was no other available source of supply, and Manchester could afford the expense of bringing it from so great a distance, there was nothing unreasonable in going to Thirlmere for the supply. But when Mr. Bateman's plans and estimates were made known, we, who live in the lake district, changed our opinion, for we found that there was hardly any analogy between this scheme and that of Loch Katrine, and that it involves such great changes in the natural character of the lake district, that we could no longer look upon it with indifference. Under these circumstances we thought it not unreasonable to ask the House to postpone the Bill, in order that a full and public inquiry might take place. We think that the natural scenery of the lake district is worth preserving, and we know that there are many schemes of this sort on foot. Liverpool contemplates a scheme of this kind, but proposes to go to Wales to carry it out. Wigan and other towns are in the same condition; and therefore we think it better to have a Select Committee or a Royal Commission to consider the whole question of the water supply of these manufacturing districts, in order to see how far recourse may be had to the lakes, and under what conditions and limitations. We are strengthened in our request by the report of the Duke of Richmond's Royal Commission, which sat on the Metropolis Water Supply Bill in 1869. That Commission was instructed also to inquire into the supply of the provincial towns, but they reported that such an inquiry would be one of great magnitude, and would involve a great amount of geographical and topographical knowledge over the whole country. They, therefore, found it impossible to undertake that further inquiry without further powers, and they resolved to complete their report on the lesser subject—the Metropolitan Water Supply—and to limit their recommendations on the larger question to general principles. They prepared an elaborate map of the geographical distribution of sources of water, and they recommended shortly, first, that no town or district should be allowed to appropriate the source of supply which naturally and geographically belonged to the town or district nearer to that source, unless there were special circumstances which justified that appropriation; secondly, that when a town or district was supplied, by a line or conduit, from a distance, provision should be made for the supply of all places on that line; and, thirdly, that on introducing a Water Supply Bill to Parliament efforts should be made to make the measure applicable to as large a district as possible, and not to limit it to the town immediately needing the supply. Now these are important questions, and it is quite worth while to have a Select Committee or a Royal Commission to inquire into them. But the promoters of this Bill object to any opposition, chiefly on three grounds. First, they say our objections are entirely sentimental, and such as no sensible or practical man would listen to for a moment; then they urge that the wants of Manchester are very pressing; and lastly, that they have no other source of supply. Now, first let me answer their objection that our agitation against the Bill is purely sentimental, and ought not to be listened to. But though they object to our sentimental views, they have condescended to meet us on our own ground. Mr. Grave, the Chairman of the Water-Works Committee of the Manchester Corporation, and the real author of this scheme, and Mr. Bateman and the Water-Works Committee themselves, all consider that the beauty of Lake Thirlmere will be very much enhanced if this scheme is carried out. Mr. Bateman says the size of the lake should correspond with the loftiness of the surrounding mountains, that Thirlmere is very small and the mountains around it very high, and that the carrying out of the Manchester scheme would make the lake much more in harmony with the surrounding scenery. Mr. Grave, in a recent letter to *The Times*, says that "Nature has for years been at work destroying her own primitive and untouched beauty." Lake Thirlmere, in fact, is growing very old and very ugly, and it is high time that it should be restored by the appliances of engineering art, that object being attained by turning Thirlmere into a reservoir to supply Manchester with water. Some of the arguments against us are founded on questions of mathematical accuracy; for instance, if Thirlmere is very beautiful with only 300 acres of water, how much more beautiful must it be when its area is increased to 700 acres. One island at present in the lake will be submerged by the Manchester scheme, but in place of that they propose to produce two new ones, and if one island is beautiful, two, of course, will be twice as pretty. Then they propose to construct a dam which will raise the level of the lake 50 feet. That dam is to be invisible except to persons on the top. It is to be as irregular and picturesque in form as the neighbouring crags and rocks; it is to be ornamented with beautiful shrubs; and last, but not least, in future the place will, no doubt, become the *habitat* of a variety of rare birds. That is the last straw which is to break the back of our sentimental opposition. They propose to buy, if they have not bought already, 10,000 acres of the adjoining common ground, and they are quite prepared to throw that open to the public for ever, and to make two brand new roads all round the lake. The lake and its surroundings are, in fact, to be converted into an extensive people's park, with a Serpentine containing two artificial islands in the middle, and a great broad path all round. But there are some people who, after all, prefer Thirlmere as it is—small, wild, and inaccessible. We have been taunted with being sentimentalists and enthusiasts; but I do not see anything wicked in that. I can appeal to Lancashire sympathy on this question. I regret that the Home Secretary is not now in his place, because I should like to appeal to him. Not long ago he delivered a lecture on what is called "Truth in Art," and in that he said that he entertained great objections to people who wore sham buttons on their boots. If he is such an advocate for truth in art, surely we might have counted on his advocacy in endeavouring in our poor way to preserve the truth of nature. So much, then, for our sentimental opposition. I now come to what Mr. Grave calls "the absolute wants of two millions of people." In the first place, I must point out that that statement is not exactly an accurate one. I am afraid Mr. Grave's mind must have got muddled with his own magnificence, or with the magnificence of Manchester, for, so far from there being two millions of people in that city, there are only 800,000. The statements which I now make are furnished by Mr. Grave and the Water-Works Committee of the Manchester Corporation. The district which Manchester is to supply is 84 square miles in extent, and comprises 800,000 persons. The present source of water supply, Mr. Grave stated, would in the summer afford 25,500,000 gallons per day; but Mr. Bateman has since reduced the amount to 24,000,000 gallons. In 1875, Mr. Bateman reported to the Water-Works Committee that, owing to the large increase in the demand for trading and

other purposes, the supply per head of population was 22 gallons per day. By a very easy calculation, we find that the 24 million gallons per day would supply one million persons with 24 gallons per head per day, which would be a thoroughly ample supply; and if the population of Manchester increases at the same rate in the future as it did during the 10 years before the last census, in 10 years time the population would not have reached a million, but would be something over 900,000. If, as Mr. Bateman says, the present supply will produce 24 million gallons per day, there would be an ample supply for over 900,000 persons at the very liberal allowance of 24 gallons per head per day. That is not my statement of a liberal allowance; it is the statement both of the Water-Works Committee and of Mr. Bateman, and, therefore, we say that Manchester can be in no great want of water for 10 years to come. Mr. Bateman argues from an opposite point of view, and, taking the increased consumption year by year, he says that during the last two years the increase has been as much as 1,200,000 gallons per day, and that you cannot count on a less increase than one million gallons per day for each year to come. Well, the people of Manchester now require 18 million gallons per day, and, by this calculation, they will require in 10 years 28 million gallons per day. But as Mr. Bateman before considered that 22 gallons per head was sufficient, we cannot think that 28 gallons per head is a necessity. Such a supply must be in the nature of a luxury, and, therefore, we cannot say that the Manchester Corporation have proved their case as to the absolute necessity of having this Water Bill passed immediately. But I may be told that I am proving too much; that it is quite impossible that a Corporation like that of Manchester should have come to Parliament with a Bill of this sort if they had not good reasons for doing so. But, in the first place, why is such a Bill asked for? I believe they have already expended much money in buying the property. Mr. Grave lives in the neighbourhood, and he has been carefully nursing the whole district for two or three years, buying here and there. Until the whole scheme came out, they did not anticipate that anybody could say "No" to Manchester, and they believed that Parliament would be no exception to the rule. They thought that, having spent thousands of pounds in the matter they could easily get Parliament to ratify the purchase. The present water-works of Manchester were commenced about 22 years ago, and it was then estimated by Mr. Bateman that the cost would be £460,000, and that they would provide a supply of 34 million gallons per day. But the actual cost has been over £2,000,000, and the supply of water that Manchester has acquired by it has shrunk from 34 million to 24 million gallons per day. The result of this is that the Manchester Corporation find that though they thought they had provided for many generations to come, such is not the case, and the income arising from the city is not sufficient without hardship to bear the cost of the introduction of a supply for the future. The consequence has been that they have come to Parliament with Bills to extend their area of supply, intending to sell the surplus, which in time will be required for future generations, for trading purposes outside the city, and thus increase the revenue of the Water Committee. Let me read the statement of Alderman King, who tried to go into the figures of the case, but who was unable to do so, principally because the Water-Works Committee of his own Corporation refused to give him any information whatever. But still he found out as much as he possibly could. He says the anxiety to sell water is manifested in a variety of ways, and the Water-Works Committee have congratulated the Council on the increased funds obtained by its sale. Mr. King read several extracts from the Committee's reports congratulating the Council on selling the water for trading purposes, and went on to show that they had passed two Acts since the first, by which they had extended the area of supply. The last Act, passed in 1863, showed how great was their wish to do that. I need not quote any further to show the anxiety of the Corporation to sell their water, to extend the trade around the city, and thus to increase their own revenues. The result is that they think they will be short of water much sooner than they expected years ago. We are told that the welfare of the poor people in and around Manchester depends on the prosperity of that city, and that its prosperity depends on the extension of trade. But I do not think the extension of trade is so much to be depended upon. What have we seen lately? There was a time, not long ago, when the expansion of our trade was considerable; new mines were opened, new mills, and new factories set at work, and thousands of people were brought into all these districts to share in the prosperity which was to result from the extension of trade. But now what has happened? Bad times have come, trade has become dull and depressed, and these extensions of industry cannot be carried on any longer with profit. The mines are closed, the mills and factories are shut up, and thousands of people have been thrown out of work, with nothing to do but to become paupers, and subsist on the charity of the public. I do not profess to understand these questions of political economy, but if all this is the necessary consequence of the extension of trade, I do not think the result is satisfactory to many people. It is a grave and serious question, whether we are justified in encouraging a forced extension of trade. I have shown that the object of the Corporation of Manchester in their proposal is to extend the trade in order to benefit their revenues. Within Manchester they do not require the water for domestic or sanitary wants, and in point of fact it will be found that this is a gigantic speculation to carry out works at an estimated cost of £4,000,000, which will probably be increased to £6,000,000 before the works are executed, without adding one farthing to their own rates. These are very important questions, and they ought not to be settled as they will be settled if this Bill is allowed to proceed in the ordinary way. We know that other large towns, such as Liverpool and Wigan, will be wanting water at some time or other, and will probably want to come to the lakes. Why, then, should not a Royal Commission or Select Committee first hold this inquiry which we ask for? Such a tribunal would lay down certain regulations, and every Bill brought in would have to be subject to these regulations, and there would not be the necessity which now exists of fighting such a Bill as the present at enormous expense. I must say that throughout the whole country we have found the greatest public interest alive on this question. We have had petitions from every county in the country, and from several thousand persons representing every rank and position, all interested, and all wishing to preserve that interest, if possible, as far as they can reasonably do so. On the other hand, the friends of the Bill have presented petitions which they say are from the people of the country. I do not wish to weary the House by reading letters on the subject; but the whole of these petitions have been got up in the most scandalous manner, and many of them have been signed by fraud. When it is represented that the Local Boards of Penrith, of Grasmere, and of Keswick have petitioned in favour of the Bill, it should be stated that the petition was carried in the Penrith Board by six votes to five, and in the Grasmere Board by four to three; and of the four who were in its favour, three were publicans and one was a painter. I have endeavoured to show, as well as I can, that our sentimental opposition to this Bill is not so unreasonable as some seem to think, that we do not wish to press it to an unreasonable extent, that the Bill is not intended to supply Manchester's domestic and sanitary wants, but is much more in the nature of a trading speculation. I have endeavoured to show that there are very grave questions raised by the Bill which ought to be matter for national inquiry, and ought not to be left to be fought out by a few poor Landowners on one side and a powerful Corporation on the other. The sequel to the Duke of Richmond's Commission has never taken place, for there has never been an inquiry, as the Commissioners suggested, into the water supply for manufacturing districts. In order that such an inquiry may take place, I beg to move —"That the Bill be read a second time on this day six months."

Mr. Lowther: In seconding the amendment for the rejection of this Bill, I may say that my honourable friend, the member for West Cumberland, has put the case so ably before the House that there is little for me to add to it, and in what I have to say I will be as brief as I can. Cumberland is one of the most beautiful counties in England, but if this plan be carried out, a very beautiful part of the county will be very much disfigured. The lake, we are told, will be raised 35 feet, and that alone will cause the submergence of a large portion of the land. The Corporation of Manchester wish to take 11,000 acres of land in the neighbourhood for this purpose, and 6000 acres more between Thirlmere and Manchester, thereby occupying a very large space. The area of the lake will be increased from 335 acres to 800 acres. My honourable friend opposite has already dwelt upon the pretence that the Manchester Corporation are going to beautify that part of the country. If they would only leave it alone, we believe it would be quite as well. Manchester has herself admitted the beauty of that part of the country, and has also admitted that that beauty would be very much interfered with, and very much destroyed, by this plan. The Corporation of Manchester are, no doubt, very powerful and very rich, and this is very much a question of who has the longer purse. The Manchester Corporation despise those who are opposed to this scheme, but if I know anything of the place, I think the House of Commons will be rather inclined to take the part of the weaker side, and will not allow this scheme to be carried into effect. We shall be told, no doubt, that water is taken from Loch Katrine to supply Glasgow. Well, that is so, but it is done without disfiguring the loch, and probably the gentlemen who live around Loch Katrine may have thought it convenient to let the water be sold to Glasgow. We have another instance of a lake being taken for a town supply in the case of Ennerdale, in Cumberland, water from which is taken by the town of Whitehaven, and the lake is said to supply the ships at Whitehaven with excellent water; but if any one who is fond of the picturesque will go to Ennerdale, he will find that there is no dam there, and nothing at all which is disfiguring. According to the provisions of the Lands Clauses Consolidation Act, I believe that, in carrying out a scheme of this kind, any surplus land which is taken must be offered for sale to the neighbouring proprietors; but in this Bill the Manchester Corporation put that provision entirely on one side, and say they are not thus to apply to the surplus land they may acquire. Another provision is that if what is called the curtilage is touched, those who touch it are bound to take the whole of the property. But an exception from this in their favour is made by the Corporation of Manchester in this instance. Then there is another exception to be made in favour of Manchester in regard to mines, for any regulations with regard to mines are in this case to be entirely put on one side. The amount of space which will be required for conducting the water is, I suppose, equal to that which would be required for a railway; and the water is to be carried by five lines of pipes, and those lines are not to be put down all at once, but one line is to be put down every five years, so that the whole country will be in a continual state of disorder, and will be constantly being pulled to pieces. The people of Manchester and the neighbourhood are now 800,000 in number, and they propose, it is said, to take water enough for three millions of people. But where are those three millions? Our belief is that such a scheme will not be wanted for 20 years. Then, again, the Corporation of Manchester do not pretend to state that this water is wanted for domestic purposes. No doubt it is wanted. The Corporation of Manchester are in a very good way of doing a first class business, and I should not be at all surprised if in the course of time we found the water carried to Manchester, and supplied to some other places on the road, with the result that Manchester will get her water for nothing. Manchester was not always the great town it is now. In 1753 Manchester had only 1700 inhabitants. Honourable members have no doubt received a document from the Manchester Corporation, in which they say that it is wholly unprecedented to reject a private Bill unless it is one of a novel character. Now this Bill is of a very novel character. Then they say that it is promoted by a large population; but that is no reason why injustice should be done, and why the weaker side should go to the wall. And then they say that a large sum of money has been expended, and therefore that the Bill ought to pass. Now that is a very bold statement, and I should not have thought they had the amount of boldness to say that because they had spent a large sum of money the Bill ought to pass. They say that the engineering work proposed is of the most trifling description. On the plans which have been deposited, however, we see embankments 10 and even 17 feet high. Then there is an aqueduct. The water must be carried over the valley somehow, that is clear, and honourable gentlemen will understand whether that can be done without interfering with the scenery. I am quite willing, however, to leave the matter to the Committee, confident as I am that, though Manchester is powerful and rich, there are many members who will recognize the necessity of looking after the interests of less powerful and poorer districts.

Mr. Birley: It is very much to be regretted that the Bill is opposed on its second reading by the honourable members for Cumberland and Westmoreland. No argument has been brought forward which would justify the House in rejecting a Bill of this character at this stage. It has not been proved that the Bill will injuriously affect the health and the social enjoyment of those who are opposed to it. On the contrary; we have the very highest authority that it is very much the reverse. I rely upon this, that if it be necessary for the health and comfort of the people of Manchester and neighbourhood, the arguments used by our opponents fall to the ground. I insist that this is the case. Now, the member for East Cumberland has attempted to show that we have plenty of water for many years to come. He, perhaps, calls five or six years many years, but it is absolutely necessary that we should look further ahead. The honourable member's calculations are incorrect, for we cannot claim any longer time than the period I have mentioned. I should have thought that the case of Loch Katrine would support *primâ facie* a precedent for the Bill going to a second reading. The people of Glasgow have benefited much by that scheme, and I expect that the people here will do the same thing. He says that it is a comparatively small sum, for which they expect to get a very large supply of water, and they have been disappointed, and have spent a very large sum to get a small supply. Then it is said that we want water for trading purposes. That is quite true, and the Manchester Corporation are under a statutory obligation to supply it. I hardly think it necessary to go further into this matter; but we have heard a good deal about the picturesque beauty of the Lake district. We are not going to have great ugly embankments, or anything of that kind. Most of the conduit-pipes will be underground, and, though we have to cross the river, care will be taken to see that the aqueduct will not be an eyesore. So far as I am concerned, I wish to see the picturesque scenery retained; at the same time, however, utility must prevail. In the fifteenth and sixteenth centuries, poets seemed to regard the Lake district as a very

charming country to live out of, while so late as a century ago Gray, writing on the same subject, passed by Windermere with very slender praise, and when he came to Grasmere he remarked that there were no houses or gardens in the little paradise. There is a remarkable difference among the arbiters of taste on the subject, and it is no more than possible that in the course of 100 years the neighbourhoods of Windermere and Grasmere will be as closely populated as the neighbourhood of Manchester. I hope the second reading of this Bill will be agreed to.

Mr. RODWELL: I should wish to say just a few words on this question, which appears to be one of a very important character, and has caused a very considerable degree of excitement outside, as well as inside, the walls of this House; and not the less so because I understand—in fact, know—that the Corporation of Manchester have taken steps to call the attention of boroughs to this question, and have asked them to use any influence they could with reference to the principle of the Bill. The consideration of this question has, consequently, assumed far larger proportions than is customary with ordinary private Bills. I do not propose for one moment, especially after the able and lucid speech of the honourable Member for East Cumberland, to enter into any of the details. I would only ask the House whether it is prepared to approve of a Bill founded on two decidedly novel principles. And here I hope I may be excused for suggesting that, if the Bill passes the present stage as it is, the Select Committee will probably consider themselves precluded from considering those two novel principles. The population of Manchester is 800,000, and it is proposed by this Bill to take powers for supplying water to three millions of people. The promoters propose to raise three or four millions of money for the purpose of the carrying out of the undertaking, and for recouping themselves for engaging in so gigantic a speculation. Now, legislation has never, hitherto, given any such powers to a Corporation. No public body has ever been clothed with statutory powers for the purpose of making profit out of the commodity of water, and, therefore, I say this is a novel principle in the Bill now before us. The second novel principle is in connection with the question of taking water from distant watersheds. This question was discussed in the report of the Royal Commission on Water Supply, which sat a few years ago under the presidency of the Duke of Richmond. The proposal here is for Manchester to take water from a district more than a hundred miles off. It is a very similar scheme to one which was submitted for Liverpool some time ago, and in regard to which Mr. Bateman, the Engineer of the present scheme, suggested to the Commissioners that the wants of the immediate district should be respected. The Commissioners, in their report, said the Legislature had always jealously watched any proposal for a town to take water from a distant gathering-ground, lest by doing so other places nearer hand might be deprived of their natural supplies. Mr. Bateman put this point very strongly in the case of Liverpool, and I now refer to the subject in order to impress on the House that the question is one of national importance which ought not to be relegated to the decision of a private Committee. The Commissioners, to whom I have referred, said further, in regard to the Liverpool case, that if it were necessary for water to be brought from a distant gathering-ground, care should be taken to supply all the places along the route. Now, why is there no provision of this kind in the Bill before us? Why is a Bill introduced in direct opposition to the spirit of that report? It is important that such questions should be considered here, for they cannot be fairly discussed in Committee. The causes of this are obvious. In the first place, there is the difficulty of *locus standi*, the consequence of which is that a great number of the outside public, though deeply interested in the question at issue, can never be heard at all. I have been in communication myself with friends living in different parts of the country, some of whom are in the habit, at certain seasons of the year, of residing in the Lake district, and who have no means other than this I am now adopting of making known their views. A Select Committee, I must repeat, are not, in my opinion, the proper tribunal for the consideration of a question such as this; it should go before a tribunal with a large scope, which could decide on all the merits of the question without being hampered by technical rules. The New Forest Bill was one of a strictly analogous nature, and it was dealt with in a way that was to a certain extent satisfactory. The question, as I have said, is a national one, and I venture to think that some Commission or Committee might take the matter in hand, and report, not only upon the details of the scheme, but on the principle involved in the Bill. If further precedents were required for adopting this course, I might refer to the Ancient Monuments Bill, in regard to which there was such an inquiry a few years ago. There are other matters in regard to which I could have wished to say a few words; but I do not want to detain the House, and, therefore, I will conclude by saying that I think it would be much more satisfactory to all interested in the scheme to have its merits considered by a public Commission.

Mr. JACOB BRIGHT: The honourable member opposite seems to think that Manchester is guilty of a great injustice to the neighbouring towns by promoting this scheme. It is a little curious that none of the neighbouring towns have petitioned against it. The real fact is, that the minor towns are benefited by Manchester going to Thirlmere. Manchester leaves many other gathering-grounds free, being able to afford to promote a large scheme like this. We should not go there for water if we did not want it, and we should not propose this scheme unless we thought it the best scheme available. The opponents have spoken of the Bill as if we did not want the water. If you wish to show that we have plenty of water, let this Bill pass its second reading. We cannot show on the second reading that we have not plenty of water; but we are sure we can show to the Committee that we have no other available source of supply suitable to our wants, and cannot get water anywhere else at such a cost. It has been said that this is a very great scheme, and that the quantity of water is excessive. We have now 25 million gallons per day, and it is true this scheme would give us 50 million gallons extra. Well, we shall want that extra quantity. The consumption of water in Manchester is a small consumption, and is only about one-half of the consumption of Glasgow; and it arises from the fact that the Manchester Corporation make stringent rules in order to limit the consumption of water. We wish the consumption of water to be abundant and lavishly used, and this we think would be for the benefit of the health and comfort of the population. The honourable members who support the rejection of the Bill have spoken of this as a novel Bill and a novel scheme. Why, it is an exact parallel to the Glasgow and Loch Katrine scheme. Glasgow goes to Loch Katrine for water, and it takes the water to Glasgow exactly as we propose to take this water to Manchester. The Loch Katrine scheme raised the levels of all of the lochs in Scotland. One of them that was interfered with was raised 25 feet. Let me tell honourable members that within the district to which the Corporation are to supply the water there is an annual increase of 5000 houses; but 5000 houses is a very great increase of houses in a year, and with the increase of houses there is an increase of industries, and of industries requiring water. The corporation of Manchester have to make very stringent provisions at present to limit the supply; but we think that it is as necessary to supply the people with water, as it is necessary to supply their homes with food. In the Lake district there are many large lakes, but there are only three of these lakes sufficiently elevated to enable water to be supplied to Manchester by the force of gravitation. One of these lakes we propose to use. It is a small lake; it is one of those lakes least visited and least known. It is a lake, the greater portion of which is seen only by pedestrians; it never is seen by people in carriages—at least, a considerable portion of it is so. The hotel-keepers in the district say that they never knew of an instance in which any one took a carriage out for Thirlmere. Something has been said about the petitions against the Bill. Why, in the district of Lake Thirlmere, or in the Lake district, we have ten signatures in favour of the Bill to one that is presented for the other side. Then with regard to the opinion of Manchester, the honourable member says that there is a growing feeling in Manchester against this scheme. There are 64 members of the City Council, and out of the 64 members only four have voted against this scheme. In Manchester and the district we do not possess all the advantages of life. We have a bad climate; we live necessarily in a smoky sky. There are countries where an abundance of water is not wanted, but it is wanted for us. I hope that the House will hesitate long before obstructing this Bill in Committee. We are prepared with abundance of evidence. It is said that we have nothing to say, but almost every objection raised here is an objection that can only be made in Committee.

Mr. RAIKES: We all agree that this is a very important subject, and for my own part I must say that the honourable gentleman who spoke last has made a very valuable contribution to the debate. The honourable Members for Cumberland and Westmoreland have put forward various objections to this scheme. One was the question of scenery, another that of the private rights that would be invaded, and the third as to the desirableness of allowing towns like Manchester to go to distant watersheds for their water supply. The objection which was founded on the interference with the picturesqueness of the district was not much insisted on, and the question of private rights, it will be seen, is peculiarly one that should be settled in Committee. Another question is as to whether the Corporation of Manchester should be allowed to become the proprietors of land in Westmoreland and Cumberland, and along the route of the water-mains from there to Manchester. When I said that the scenery of the Lake district is a secondary difficulty, I meant to point out that the question of necessity was the one above all which ought to occupy the attention of the House. If the promoters of the Bill have made out their case to the satisfaction of the House, and an absolute necessity exists for this measure, then I think I need not trouble myself further; but if they have failed to do so, then I think the case is one rather for the consideration of the House than to be sent to a Committee upstairs. What is the case as put by the honourable Members for Manchester, who have both very fairly, and I think very moderately, stated the case for the promoters? They have told us that at the present moment the water supply of Manchester amounts to about 25 million gallons per day. That supply at the present time is provided for a population of about 800,000, and the supply to each person is about 22 gallons per head per diem. It is perfectly clear, therefore, that the present water supply of Manchester is adequate to the supply of a population of 1,100,000. We are told that Manchester is growing so rapidly that, in the course of a very few years, the population will amount to 800,000 or one million, and that then the necessity for this large additional supply will arise. Now, I know something of Lancashire myself, but I certainly was not aware that the progress of Manchester, although very considerable, was relatively as great as that of many other populations in the north. I believe there are some other parts of that great county and of the northern district in which the progress has been much more rapid, and the claims of the population would, under similar circumstances, require quite as great consideration. What is it that the Corporation of Manchester propose to do? They propose to ask Parliament to give them a water supply of 50 million gallons daily for their population. That is in addition to the existing supply of 25 million gallons per day, which is clearly in excess of the wants of the community; and yet the Corporation of Manchester come and ask that they shall be supplied with such an additional quantity of water as will treble the existing supply, and be equal to the demands of a population of 3½ millions. We have heard talk of heroic legislation. There are Members of this House who consider that it becomes the great municipalities of this country to adopt a more enterprising attitude than they have hitherto done, and they regard this as a legitimate step on the part of Manchester, although it marks a new departure from the course pursued generally by the municipal bodies of the country at large. If Manchester is to be allowed to have this enormous supply of water, if Manchester is to take sufficient to supply at this moment the whole of the county of Lancaster, you will have to consider three different bodies that will be affected by this heroic and enterprising legislation. First, the ratepayers of Manchester. Are they to be burdened with an immense expenditure, equivalent, they say, to a sum of three or four millions of money, but which would possibly reach seven or eight millions before the scheme could be carried out completely? Secondly, the owners of property throughout the district, who, for a distance of considerably more than a hundred miles, would have to submit to an interference with their property by the formation of a gigantic culvert equal in extent to a dozen lines of railway. Lancaster, Preston, Accrington, Wigan, Bolton, and many other towns will have to come to Manchester and ask for water; and, although you may be told that Manchester does not propose to monopolize the supply, yet the fact will be that for years to come you will have all these great populations throughout Lancashire and the North of England, and probably in the West of Yorkshire also, coming and asking for Bills to legalize arrangements made with Manchester with respect to the water supply. I am sorry that I have detained the House at such a length, but this seems to me one of the most important questions the House can consider. If the question stood as it was left by the speech of the honourable member who first addressed the House, I should feel it my duty, although exceedingly reluctant to take such a course, to vote against the second reading of the Bill. But a suggestion has been thrown out by my honourable friend behind me, the member for Cambridgeshire (Mr. Rodwell), which I hope the House will adopt, and I trust to hear from the Government, before the debate closes, some indication of their views. It is impossible that such a Bill as this could be considered upstairs, and by an ordinary Private Bill Committee, and I would suggest that it should be referred to a Hybrid Committee, which is one of the most useful parts of the arrangements of this House. The Committee then might consider this question through all its bearings, public as well as private; and they might, at all events, lay down a principle for the guidance of the House in dealing with future questions connected with the water supply of large towns. Until such a Committee have sat upon the Bill, I do not think we should be justified in refusing to read the Bill a second time; but, unless such an arrangement is come to, I should most reluctantly, but as a matter of duty, find it impossible to support the second reading of the Bill.

Mr. W. E. FORSTER: I quite agree with the course which has been recommended by the honourable gentleman who has just spoken; and, if the House will allow me, I will support it on one ground, which he scarcely referred to. I do think that the public are concerned in the question. I am very sorry to throw any obstacle in the way of my honourable friend the Member for Manchester. I do not think we ought to throw any obstacle

in the way of our large cities obtaining an adequate supply of water. It is possible that Manchester may be now asking for more water than most other towns, and, perhaps, for more water than appears to be necessary; but if so, I think it is a fault on the right side, and I should be sorry to throw any obstacle in its way. But, on the other hand, in the manner in which they propose to get their water, I do think they are likely to interfere with the public interests. Now, I hope I shall not be thought to be Quixotic or over-sentimental when I say that the scenery of the lakes is a public interest. My honourable friend the Member for Manchester quoted the lines of a poet a hundred years ago, in which the writer did not appear at that time to regard the lake scenery with the eye of an artist. He appears to have been horrified and disgusted by the mountain scenery rather than pleased with it. But that is not the feeling now, and I do not look forward to any period when it will be. We have, then, this fact, that we have in this part of England some of the most beautiful scenery in the world, and I think the House of Commons and the country should retain it. Some of the supporters of this Bill think that the scheme would not injure the lake which will be principally affected by it. I wish honourable members would go down to the district and look at the lake, and see for themselves what is going to be done. We are told, in the first place, that Thirlmere is a lake which very few people go to see, and that most tourists who visit the lakes pass by it without seeing it. Now all you have to do, if you wish to see Thirlmere, is to go from Ambleside to Keswick, and go round the lake. A very little time will enable you to see its beauties, and to discover that it is one of the most beautiful objects in England. The Corporation of Manchester say they are not going to spoil it. Yet they are going to put at the upper part of this beautiful lake a great big reservoir, which may go up and down some 50 feet at least on account of the rainfall in the district. A heavy rainfall is very often followed by a season of drought, and I believe the engineers are perfectly right in arranging for such a fluctuation of the level of the reservoir. The consequence will be that, instead of a very beautiful lake, you will have a great pond, with a constant exposure of mud. (No, no.) At any rate, if the honourable member who says "No" will visit some of the other lakes in the neighbourhood, I believe he will come to the conclusion that there may be a good deal of mud, and the beauty of this very beautiful scenery will be spoilt. Loch Katrine has been mentioned, but Loch Katrine is not a parallel case. Loch Katrine is so large that in supplying Glasgow with water there is no perceptible alteration in the level. It would be very different in the case of Thirlmere. Now I quite admit that if Manchester cannot get water except by going to Thirlmere, even if the consequence would be that the lake would be utterly spoiled, then the lake must be spoiled. Manchester must have enough water for its own drinking and sanitary purposes. There cannot be a doubt that in arranging this matter there ought not to be a question between scenery and a proper supply of water to any large population; but if, instead of this being the only place from which Manchester can get a supply, it turns out that Manchester could get it from many other places, I think that fact would make a great deal of difference in the view we should feel inclined to take of the question. It is said that there is a gentleman of great energy—I have not the honour of his personal acquaintance—who has set his mind on going to Thirlmere—that it is his great wish to carry out his plan in regard to Thirlmere; but that is not a sufficient reason why the beauty of the lakes should be sacrificed, nor is it a sufficient reason why the Corporation should spend four millions, which will probably grow to six millions, upon this particular scheme. The present estimate is, I believe, £3,700,000; but there is very little doubt that the actual expenditure would be considerably more. That, however, is a question for the ratepayers of Manchester, and not for me. Taking the lowest estimate—viz., £3,700,000, if it was only a case of spending one or two hundred thousand pounds more, I do not think Manchester ought to be opposed; but why not let all these questions go to a Committee? Let them be examined by a properly constituted Committee upstairs, like any other question, and everything would then be arranged and settled by those who are interested in the matter. But you cannot expect the general public of England, who are deeply interested in this scheme, to pay large engineering bills or counsel's fees, or to appear before a Committee to state their case merely through some riparian owner. Therefore I support the suggestion of my honourable friend that the question should be sent to a Special Committee *ad hoc*, because I believe the public ought to be represented, as it is a public question. I hardly think that the promoters themselves will object to such a course. Surely they will acknowledge that the English people have some interest in such scenery as this, and will admit that it is quite fair that they should be thoroughly heard before a Committee. I can only say that my vote will depend on whether such an arrangement can be made. I should prefer that there should be a general inquiry by a Committee, or a Commission, into the water supply of the large manufacturing towns, and I think London ought to be included. The inquiry should extend to how far there ought to be a supply obtained from those districts where there is a great rainfall, and under what conditions it should be given. It may be rather hard on Manchester to oblige them to wait until there has been such an inquiry, but I must say that one argument they would give us is not an argument at all. If the Corporation of Manchester have chosen in some measure to forestall the decision of Parliament by buying property at a considerable cost, they must take the consequences. Our object now is to secure a thorough inquiry, and if a hybrid Committee are appointed for that purpose, then, I think, we ought not to vote against the second reading of the Bill. Otherwise I shall be obliged personally to vote for the amendment.

Mr. Birley: If it be the wish of the House, I am prepared to accept the proposition of the Chairman of Ways and Means.

Mr. Charley: An honourable member who spoke in opposition to the Bill seemed to think that there had been some difference of opinion among those who would have most benefited by it. I can say that that is not so, and that, so far as the Corporation of Manchester are concerned, they have passed an unanimous vote in favour of the Bill. My honourable friend, the Member for Chester, said there had not been a large increase in the neighbouring population. Speaking for Salford, all I can say is that in 1871 the population was 120,000, and that it is now 200,000. Therefore, as far as Salford is concerned, that observation does not apply. In my humble judgment, the interests involved in a sentimental grievance ought not for a single moment to be allowed to weigh against the interests represented by the honourable Member for Manchester.

Mr. Fletcher: As a resident in the county of Cumberland and in the neighbourhood of the great works proposed to be carried out by the Manchester Corporation, and representing the opinion of a great many of the residents of the Lake district, I trust the House will pardon me if I detain them for two or three minutes. I will not enter at all into the engineering matters which are connected with this scheme, but I will allude merely to its æsthetic aspect, which must be interesting to every member of the House. It seems to me that there is a good deal of misapprehension as to what is proposed to be done by the Manchester Corporation. The right honourable Member for Bradford has alluded to the question of the rise and fall of the lake. He seems to be altogether under an error as to what is proposed to be done. I can assure the House that even if the Corporation draw the full 5 million gallons per day which they propose to take, the lake will not rise or fall more than it does at the present moment. The effect of this Bill will be to reclaim 11,000 or 12,000 acres of the most beautiful part of Cumberland from the incursions of those æsthetic gentlemen who come down surveying the district and building Gothic villas upon the shores of this beautiful lake. The Corporation of Manchester have no intention of selling any portion of the area for building purposes, and, in fact, so far from Thirlmere being spoiled, I look upon it as a great public improvement, and as a brand plucked from the burning. You will find that every advantageous point has been seized by these æsthetic gentlemen for building their villas and for discharging their sewage into the lake. There is nothing whatever proposed to be done by this Bill which would be prejudicial in the slightest respect to the county of Cumberland. If there is one town which is more interested than another in the preservation of the beauty of the lake, it is the town of Keswick, and what do I find? In a town of 700 ratepayers, 650 are in favour of the Bill of the Manchester Corporation. They believe that so far from the Lake of Thirlmere being spoiled by what is proposed to be done, it will practically be improved. This is a great scheme, and a scheme which ought not to be burked in its inception; and I hope the House will by a large majority pass the second reading of the Bill.

Mr. Sclater-Booth: I have listened to the arguments which have been adduced both for and against the second reading of the Bill. The provisions of the measure were brought before me some weeks ago by a deputation from Manchester, and I had the advantage of hearing from the accomplished Engineer of that Borough his views as to the mode in which it was proposed to carry out this scheme. I think the House will admit on all sides that there is much that is novel in the plan, something *primâ facie* objectionable, and a great deal that ought not to be considered and decided by an ordinary Private Bill Committee. Now, I have always felt that there is a great difficulty in getting upon a Private Bill Committee a fair and adequate representation of the interests involved in such a measure as this. But it appears to me that it would be a harsh and unusual proceeding to refuse the second reading of a Bill involving a matter of so much importance to so great a community as Manchester. On the other hand, it is equally necessary that the Bill should go before a Committee where the allegations so admirably stated by my honourable friend the Chairman of Ways and Means may have a reasonable opportunity of being examined. The reference I had proposed on the subject would be something to this effect: That the Bill be referred to a Select Committee of nine members, five to be nominated by the House and four by the Committee of Selection, and that such of the petitioners as may have presented petitions for or against the Bill may, if they think fit, be heard before such Committee by their counsel or agents; that it be an instruction to the Committee to inquire into and report upon the water supply of Manchester and the neighbourhood, and how far and under what conditions permission shall be given to make use of any of the Cumberland or Westmoreland lakes for such supply, having particular regard to the requirements of the population in the immediate vicinity of the lakes; and to report whether any, or, if so, what, provisions will be required to be made. This proposition, I believe, includes all the objections which have been raised in the course of the debate, and if the House should be of opinion that the Bill should be read a second time, I will move a resolution in accordance with the suggestion I have made.

Mr. Percy Wyndham said: I will not enter into the merits of the case, as we now understand that the scope of the inquiry is to be very much enlarged. But I wish to put a question to my right honourable friend the President of the Local Government Board. If we are to understand that an inquiry of this nature will be entered into, it must necessarily cost an immense amount of money. Who is to pay the expense of opposing the Bill? The opponents will be virtually fighting the battle of the United Kingdom, and I would suggest that, instead of referring the Bill to a Select Committee, there should be a Royal Commission.

Mr. Dodson said: The Hybrid Committee, before whom the Bill is to be sent, will hear all the opponents of the Bill, and further hear all witnesses, just as if it were a Public Committee appointed to inquire into a public matter. If the proposal of my honourable friend the Chairman of Ways and Means, and endorsed by my honourable friend on behalf of the Government, is carried, it appears to me a very proper course to adopt, and I would recommend the members interested in the Bill to agree to the proposal.

Mr. E. S. Howard said he would be very willing to accept that elucidation of the difficulty. He did not think they should ask any more, and he should therefore withdraw the amendment.

Mr. Fawcett: I wish to ask a question before the Bill is read a second time. It has been admitted that this is a public question, and one in which the whole country is interested. The President of the Local Government Board has read out something which he proposes, but what he read was very imperfectly heard and without having seen it on the paper we are asked to assent to it. What I wish to ask is, that we should have at least 24 hours to consider the terms of this reference before we actually decide upon adopting the proposal. I may be under a mistake, but it seems to me, as far as I gathered the words, the terms of the reference he proposes will admit what seems to me to be the gist of the whole inquiry —that is, whether, if this additional water be necessary for Manchester, it cannot be obtained except from the lakes. I think the great majority of this House and of the country think that if she can get it from any other place it is not desirable she should go to the lakes, because the lakes are particularly beautiful pieces of scenery which ought to be preserved. Therefore it seems to me that the terms of reference are not sufficient, but that there should be an instruction to the Committee that they should not only make inquiry about the lakes, but also inquiry as to whether the necessary water could not be obtained from any other place.

Mr. Newdegate: I desire to make only one observation. I think the House is giving the Corporation enormous powers, I believe almost rash powers, for a work which is in the nature of a speculation supported by public money. We have before the House a Bill for creating some uniformity, some consolidation, in the governments of counties and towns. At present the districts affected by this scheme have not by the admission of the House that concentration of powers which is desirable, and I rejoice that the Government has brought in a measure which may adjust the differences and the powers that now exist as between the large borough interested and districts which will be affected by this scheme.

Mr. Whitworth: I beg to endorse the suggestion of the honourable Member for Hackney, that the President of the Local Government Board should give us 24 hours, because I believe there is no doubt that within the district from which the Manchester Corporation are proposing to obtain water there is sufficient water to provide the whole kingdom, if properly utilized. This is an important question, and I hope the reference will be put on the paper before it is finally debated.

Mr. Sclater-Booth: It is necessary that I should put the first part of the reference now, otherwise the Bill would go to an ordinary Committee. But as it seems to be the desire of the House, I will put the words of the instruction, which I propose to move, on the paper, and then the House will adopt it or not, as it thinks fit.

Mr. Julian Goldsmid: It would be a much more regular course to post-

pone the second reading of the Bill until we know the exact terms of reference. As I entirely concur in the observations made by my honourable friend the Member for Hackney, I propose to move the adjournment of this debate, and to fix it for Thursday, in order to enable us to see the whole of the terms of reference. This is a matter of public importance, and ought not to be hurried over, and the city of Manchester will gain nothing by precipitation. I think we shall be consulting the interests of Manchester and the country affected, if we adjourn the whole matter till Thursday. I beg to move the adjournment.

Mr. BIGGAR seconded the motion.

The CHANCELLOR of the EXCHEQUER: It seems to me hardly convenient to adjourn the debate. The members who have considered the subject have already taken part in the discussion, and I do not know whether they wish to speak again. I believe it would be far more convenient that the course suggested by my right honourable friend the President of the Local Government Board should be followed—that the House should decide the Bill is to be sent to a Hybrid Committee. It would be quite right, as suggested by the honourable Member for Hackney and others, that opportunity should be afforded to honourable members of seeing the precise terms of the reference; and what the right honourable gentleman proposes to do is nothing more than a simple motion that the question be referred to a Committee, and then he will propose to put on the paper the instructions which are to be given to the Committee. These instructions will come under the notice of the House, and can be discussed and settled at the convenience of the House.

Mr. JULIAN GOLDSMID: We shall be satisfied with this assurance, and I withdraw my motion.

The motion for the adjournment of the debate was then withdrawn, and the Bill was read a second time without a division, and referred to a Select Committee of nine members, five to be nominated by the House, and four by the Committee of Selection, where such petitioners as shall have petitioned for or against the Bill may appear, and be heard by their counsel or agents.

WEDNESDAY, FEB. 13.

WEIGHTS AND MEASURES BILL.—This Bill, to consolidate the law relating to Weights and Measures, was brought in by Mr. Edward Stanhope, Sir Charles Adderley, and the Attorney-General; read the first time, and ordered for second reading.

Petitions against the Cheltenham Corporation Water Bill were presented from (1) Cheltenham Water-Works Company, (2) Mary Lawrence.

THURSDAY, FEB. 14.

Petitions were presented against the Cheltenham Corporation Water Bill, from (1) Cheltenham Gaslight and Coke Company, (2) Thomas Packer Walter Butt, (3) Charlton Kings Local Board, (4) Richard Rogers Coxwell Rogers, (5) Midland Railway Company; and against the Scarborough Corporation Water Bill, from Sir Harcourt Johnstone, Bart.

FRIDAY, FEB. 15.

The following resolution, reported from the Standing Orders Committee, was agreed to:—"That, in the case of the Limerick Corporation Gas Bill, Standing Order No. 62 ought to be dispensed with. That the parties be permitted to proceed with their Bill."

Petitions against the following Bills were presented:—Cheltenham Corporation Water, from (1) Banbury and Cheltenham Direct Railway Company, (2) Anne Catherine Gardiner Welch, (3) Nathan Nathaniel Dyer, 4) Rev. Thomas Purnell, (5) Owners, &c., of houses and lands in Charlton Kings; Nottingham Improvement, Gas, and Water, from Nottingham Water-Works Company; Scarborough Corporation Water, from North-Eastern Railway Company.

MANCHESTER CORPORATION WATER BILL.

Mr. SCLATER-BOOTH moved, in accordance with an understanding come to on Tuesday:—"That it be an instruction to the Select Committee on the Manchester Corporation Water Bill that they have power to inquire into and report upon the present sufficiency of the water supply of Manchester and its neighbourhood, and of any other sources available for such supply; to consider whether permission should be given to make use of any of the Westmoreland and Cumberland lakes for the purpose, and if so, how far and under what conditions; to consider the prospective requirements of the populations situated between the Lake district and Manchester; to inquire and report whether any, and if so what, provisions should be made in limitation of proposals for the exclusive use of the water of any of the said lakes."

Mr. WHITWELL proposed to widen the terms of the instruction by substituting for the words "between the Lake district and Manchester" the words "between the Lake district and Lancashire and Yorkshire."

Mr. SHAW-LEFEVRE pointed out that the original terms of the instruction would exclude Liverpool.

Mr. JACOB BRIGHT and Mr. HARDCASTLE opposed the amendment.

Mr. RAIKES observed that the instruction, as it stood, was based on the recommendation of the Duke of Richmond's Commission, and he thought it would be rather hard on Manchester if its Bill were made the means of raising a very large question in many respects unconnected with that city. The Lake district might supply Yorkshire with water, but the Yorkshire people would hardly care to go there for that purpose. He had no objection to the amendment *per se*, which might deserve the attention of Parliament; but it would tend unnecessarily to prolong the inquiry, and would not be the best or the fairest mode of attaining the object which the honourable Member for Kendal had in view.

Mr. SCLATER-BOOTH having also expressed a hope that the amendment would not be pressed,

Mr. WHITWELL consented to withdraw it.

Serjeant SPINKS then proposed another verbal alteration in the instruction, in order that the town he represented (Oldham), and other places within eight or ten miles of Manchester, might be included within the scope of the inquiry; but, on Mr. Raikes intimating that, in his opinion, the case of those towns would not be excluded by the instruction as it stood, the amendment was not pressed.

The instruction, as originally moved, was then agreed to.

Mr. SCLATER-BOOTH subsequently gave notice that on Monday, Feb. 18, he would move—"That Dr. Lyon Playfair, Mr. Salt, Mr. Rodwell, Sir Ughtred Kay-Shuttleworth, and Mr. Knowles be members of the Select Committee on the Manchester Corporation Water Bill."

SATURDAY, FEB. 16.

Petitions against the Nottingham Improvement, Gas, and Water Bill were presented from (1) St. Ann's Mutual Benefit Building Society and others, (2) Midland Railway Company, (3) Justices of the Peace for the County of Nottingham.

GLASGOW WATER SUPPLY.—Dr. Mills, F.R.S., of Anderson's College, Glasgow, reports that, during last month, the water supplied to the city from Loch Katrine was of a light brown colour, and contained muddy particles and a few flakes.

Legal Intelligence.

LAMBETH POLICE COURT.—FRIDAY, FEB. 15.
(*Before Mr.* ELLISON.)

LEAVING WORK WITHOUT NOTICE.

Mr. HOWARD appeared on behalf of the South Metropolitan Gas Company with reference to three summonses taken out against men, who had been in the employ of the Company, for quitting their work without proper notice, whereby the plaintiffs had suffered damage, and claimed compensation. He explained to the Court the extreme inconvenience arising from men in the position of defendants by their suddenly leaving their work. The defendants, however, having returned to their work, and expressed regret for their conduct, the Company had no desire to press the matter. It was only desired that men should know that they were bound to carry out the arrangements they entered into when taken on by the Company, and failing that, they were liable to be prosecuted.

Mr. ELLISON said he quite agreed with the importance of such a matter, and allowed the summonses to be withdrawn.

ALLEGED FRAUDULENT CONNECTION OF PIPES.

Maire Poinbeuf, of 2, Union Road, Clapham, was summoned, at the instance of the Phœnix Gas Company, for having, on or about the 1st of January, unlawfully connected the meter with the pipe through which gas was supplied by the Company, without having given due notice of the intention so to do.

The defendant did not appear, but a person who said his name was Therry came forward in answer to the summons. He addressed the Court in French, and, according to his statement, it appeared that he was not unaware of the matter. The defendant was away in Paris, and had been there over a month.

Mr. *Allen*, the Chief Inspector of the Company, said the defendant had been supplied with gas up to December last. In consequence of the non-payment of money, the gas was cut off in the ordinary way. One of the Sub-Inspectors went to the house on the 6th inst., and found that the connection had again been made, without the knowledge or consent of the Company, and upwards of 6000 feet of gas consumed. Orders were afterwards given, and the gas cut off from the street.

Mr. ELLISON said no doubt it was a serious matter for the Company, and a very proper case to bring before the Court; but as the defendant was not present he would not convict. He would, however, adjourn the case, in order to enable the Company to take further proceedings.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

METROPOLITAN BOARD OF WORKS.—At the meeting of the Board on Friday last, a report was presented by the Special Purposes and Sanitary Committee, recommending the appointment of Mr. W. J. Dibdin as Gas Examiner, under the provisions of The Gaslight and Coke Company's Act, 1876, at the testing-place fixed by the Gas Referees in Ladbroke Grove. After some discussion, the matter was referred back to the Committee. It was decided to inform the Vestry of Chelsea, in reply to a letter received from them, that when the London Gas Company apply to Parliament for further powers, the Board will take measures for subjecting the Company to the same regulations, as regards the lighting power of their gas, and other matters, as apply to The Gaslight and Coke Company. A further report of the Committee recommended that the Board of Trade be informed, in reply to their communication on the subject of the proposed alteration of the penalty clauses of the Acts of The Gaslight and Coke, Commercial, and South Metropolitan Gas Companies, that the Board do not object to the addition of the words "not exceeding" to the proposed new clauses, as suggested by the several Companies. The subject was referred to the Works and General Purposes Committee for consideration and report.

Dr. Whitmore's report on the illuminating power, pressure, and quality of the coal gas consumed in the parish of Marylebone during January, and supplied by The Gaslight and Coke Company:—

	Illuminating Power in Sperm Candles.			Mean Pressure in Tenths of an Inch.		Mean Quanty. of Sulphur in 100 Cu. Ft.	Mean Quanty. of Ammon. in 100 Cu. Ft.	Sulphuretted Hydrogen
	*Mean of 25 Obsers.	Highest.	Lowest.	Highest.	Lowest.	Grains.	Grains.	
Gas supplied from the Fulham works .	16·62	17·51	15·94	21·11	9·63	—	0·38	No trace
Gas supplied from the Beckton and Bow works	16·72	17·42	16·10	33·27	16·68	—	0·30	No trace
Cannel gas supplied from the Pimlico works	20·55	21·04	19·96	22·11	12·57	—	0·13	No trace

Mean of daily readings of barometer. . . . 30·43
" " " thermometer . . . 45·90

* Each observation consists of ten readings of the photometer, at intervals of one minute.

The mean illuminating power of the three gases consumed in the parish during the month averaged rather more than half a candle beyond the legal standard, the range being about one candle. Once only was the Pimlico gas slightly below the standard, and twice only the cannel gas. Owing to the meter used in testing for sulphur being under repair, the amount of that impurity in the three gases could not be ascertained. As regards ammonia, all the gases may be said to have been almost free from it. The pressure was generally good, and no trace of sulphuretted hydrogen was at any time detected by the ordinary tests.

METROPOLIS WATER SUPPLY.

LAMBETH VESTRY.

At the Meeting of this Vestry on Thursday last, the question of the Metropolitan Board's schemes was brought up for consideration on a proposition by

Mr. H. WHITE, who moved—"That this vestry, while endorsing the recommendations of the various Commissions appointed by Parliament to the effect that the supply of water to the Metropolis should be regulated without reference to the profit to be derived therefrom, disagree with the proposals intended to be presented to Parliament by the Metropolitan Board of Works, whereby, in addition to the purchase of the interests of the existing Water Companies, to be computed upon a valuation, it is proposed to spend many millions of money, to lay down a new and second supply to

the Metropolis, entailing a great increase to the Metropolitan rating, and causing disturbance of all kinds to the roads and footways throughout the Metropolitan area. That the Vestry Clerk be instructed to draw up a petition to the Houses of Parliament embodying these views, and that the borough and county Members be requested to support the prayer thereof; and, further, that a copy of the above be transmitted to the Metropolitan Board of Works, and all Vestries and District Boards in the Metropolis." He considered that both the schemes were unnecessary. He had looked over the Purchase Bill, and could not find one sentence in it indicating the advantage that would accrue to the ratepayers by the Board purchasing the undertakings of the Water Companies. There was nothing showing that there would be a reduction in the charges for the water, nor what the rating powers of the Board would be. The only thing which appeared plainly indicated was that there would be little, if any, improvement in the quality or the quantity of the water, so far as the supplies now in the hands of the Companies were concerned. With reference to the financial part of the scheme, he argued that the estimated expenditure of £25,000,000 would be largely exceeded. As to the second scheme, it was a "fancy scheme," and was opposed to the views of nearly all, if not all the Vestries of the Metropolis, who looked upon it as quite uncalled for. For this experiment (and it could scarcely be called anything else) it was estimated that some 5½ millions would be needed; and there would be an outlay of £250,000 required annually—being more than the whole of the Insurance. Companies received from their fire premiums. A good deal was said about high-pressure service for extinguishing fires; but buildings in this country were constructed very differently from those in America, and the liability to fire was not so great as was supposed. If the second scheme were put into operation, the streets would have to be broken up, and considerable inconvenience to trade would result. Two exhaustive inquiries had taken places in 1867-9 with reference to the water supply of the Metropolis, the essence of which was that the water was of such a character that there was no reasonable ground of complaint. In the Purchase Bill the Board were asking for unlimited powers to spend money Against this he protested, and urged that the best very way would be to compel the Companies to carry out their present obligations. As to the second Bill, it had been hurried on, and had passed a second reading. The Purchase Bill had also been read the first time. In conclusion, he expressed an opinion that the two schemes would involve an expenditure of some £40,000,000.

Mr. HILL said the Vestry would be unanimous that it was desirable the water supply should pass into the hands of a body not receiving a profit upon it, but it was quite another question as to who the new body should be. The conference at the Chamber of Trade were unanimous against the second Bill of the Metropolitan Board of Works, and were antagonistic to the first Bill as brought in by that Board.

Mr. SHARPLEY thought the Vestry should unite with the other parishes in any opposition taken. The slowness of the Metropolitan Board in dealing with the floods in South London contrasted with the undue haste with which the second Bill was being pushed forward.

Mr. AKERMAN said he was opposed to the Metropolitan Board having the control of the water supply. If they ever had it they would be sure to poke their noses into houses in the most arbitrary manner. Besides, the Board were most irresponsible—in fact they would not even attend to Parliament.

Mr. C. WHITE thought the Board were promoting these schemes so as to have a little more patronage at their disposal. Lambeth should combine with other parishes in opposing these Bills. The ratepayers had themselves very much to blame. The Purchase Bill was most unsatisfactory, and the second Bill had been hurried on to avoid its being properly discussed by the Vestries.

Mr. FOWLER supported the resolution. A mistake had been made, he thought, in fixing the standard of pure water too high, and a further mistake was made in requiring a pressure of some 70 to 80 feet. But for these two matters, there would be no necessity for anything else than the supply now afforded by the Companies. In the House of Commons, however, the whole question would be argued out, and he hoped the ratepayers would be properly represented there. As ratepayers they would have *locus standi*, although not as Vestries. Even as Vestries, the question of *locus standi* was more one of precedent than one of principle. In regard to water, the Metropolitan Board of Works were not the Local Authority. The Vestries, being the Sanitary Authority in each district, had in this way a claim to be heard, and he trusted they would be represented by counsel. The general affirmation of the resolution was exceedingly good. The water supply should be as good as possible without a profit being made. In conclusion, he expressed an opinion that the rosy statements as to the cost might be doubled, and be nearer the mark. He did not blame the Metropolitan Board of Works for taking the matter up, seeing that public opinion forced it upon some one to do this; but now that that Board had taken such a step, it rested with the Vestries and the Ratepayers to take care that the body to whom the control of the water supply might be handed should be itself under good control.

Mr. REID thought the Metropolitan Board of Works were in this instance trying to lead public opinion rather than to give expression to it. He asked the Vestry if there were not some motive in the Board pushing forward, as they had done, their second Bill. As to the Purchase Bill, it was undesirable, because it was expensive, and contained no provisions for the protection of the ratepayers. He preferred that the Water Companies should be made to do their duty. With reference to the second Bill, the new supply scheme, there would be opposition in the House as well as from those outside. It was Utopian and impracticable, and would cause great expense and inconvenience. It was a scheme for advancing the whims and crotchets of certain engineers, and for draining the pockets of the ratepayers.

Mr. TURNER said he did not suppose there had been any pressure brought to bear upon the 45 middle-aged and old gentlemen at Spring Gardens, but those gentlemen assumed that they were equal to anything—even to filling up vacancies in Her Majesty's Government.

Mr. BENNETT said the Metropolitan Board ought to compel the Water Companies to do their duty, instead of indulging in phantom schemes of their own for acquiring possession of the works.

Mr. FOWLER said the Metropolitan Board had not so much power as the Vestries over the Companies.

The resolution was carried unanimously, and delegates were appointed to represent the Vestry at the St. Pancras conference.

ST. PANCRAS VESTRY.—At the Meeting of this Vestry on Wednesday last, a report was presented from the Special Committee in reference to the Metropolitan Board Bills, in which it was stated that the Committee considered the action of the Board of very serious importance, as it pointed to the Vestries and District Boards not being allowed to be heard against any Metropolitan Board scheme however objectionable. They had therefore determined to summon a conference of representatives of Vestries to consider the subject. The course taken by the Committee was approved, and it was resolved to instruct counsel to support a petition to Parliament from the Vestry for *locus standi* to oppose the Water Bills.

CONFERENCE OF VESTRIES.—On Friday last a Conference of Delegates from the Metropolitan Vestries, comprising nearly one hundred members, was held at the Vestry Hall of St. Pancras, for the purpose of organizing an opposition to the schemes of the Metropolitan Board, and especially to protest against the attempt of the Board to prevent the Vestries and District Boards having *locus standi* before the Parliamentary Committee on the Bills. The Rev. Canon Spence, Vicar of St. Pancras, was elected to preside. Mr. Watkins, member of the Metropolitan Board for St. Pancras, pointed to the fact of the disunion there has been in the Metropolitan Board itself with regard to these Water Bills, the second, for the new supply, having been carried by a majority of three only. Neither the Vestries nor the Ratepayers had been consulted by the Metropolitan Board, and there was no proof whatever that they were not fully satisfied with the existing water supply. No less than 47 petitions had been presented against these Bills, but the Metropolitan Board had determined, if possible, that only one side should be heard, as they had not only determined to oppose the Vestries and District Boards having *locus standi* before the Committee, but were even endeavouring to shut out the Water Companies from appearing upon their petitions before the Committee. He moved the following resolution:—"That, in the opinion of this meeting, the action taken by the Metropolitan Board of Works in determining to object to the *locus standi* of the Vestries and District Boards of the Metropolis is unjust to such Vestries and District Boards, and ought to be resisted, seeing that the said Board claim for themselves the position of being the Authority for the local management of the Metropolis, and thus ignore the large interests represented by the Vestries and District Boards." The motion was carried. It was also resolved—"That in the opinion of the Conference the Metropolis Water Supply Bill, which has been introduced into the House of Commons as a private measure, ought at once to be withdrawn, and that the funds of the ratepayers entrusted to the Metropolitan Board of Works ought not to be further used in pressing upon Parliament the consideration of a measure which has been almost universally condemned." It was further determined to instruct counsel to appear before the Parliamentary Committee, and endeavour, if possible, to defeat the nefarious designs of the Metropolitan Board.

CONSUMERS GRIEVANCES IN SOUTH LONDON.—On Tuesday last a deputation from a meeting of tradesmen in the borough of Southwark had an interview with the Home Secretary at the House of Commons, in reference to the charges recently made by the Water Companies in the southern districts of the Metropolis. Mr. Edward Clarke alleged that the Companies had raised their demands to a very considerable extent, taking into consideration nothing but the rental of the house to which the water was supplied. Manufacturers had the right to have the water by meterage; but where there was a dwelling attached to the manufactory, the Companies insisted upon their right to charge up to 5 per cent. upon the rental value of the house. This, it was contended, was unjust. The object of the deputation, which represented an Association lately formed, was to ask the Government that, in future, consumers might only be rated for their water supply according to the accommodation they received. Mr. Cross intimated that the justice of the right claimed in the present instance under a private Act would be considered in future legislation.

UXBRIDGE LOCAL BOARD.—This Board have lodged a petition in Parliament against the Metropolitan Board Supply Bill, on the ground that Red Hill, Denham, where it is proposed to sink the well and erect the pumping-station, being only about 1½ mile from the pumping-station of the Uxbridge Water-Works, and in the same bed of chalk, the Local Board are advised and believe their supply will be materially diminished, if not entirely destroyed. It will be possible, they say, for the Metropolitan Board to acquire land immediately or nearly adjoining the Uxbridge Works, and that no power is given by the Bill to the Metropolitan Board for supplying the Uxbridge district with water in case of the present supply being wholly or partially cut off by the execution of the works proposed to be authorized. The supply cost upwards of £20,000, and the system of drainage, which is entirely dependent upon it, upwards of £30,000, so that the petitioners feel that they have good ground to ask that provision might be made for their protection.

METROPOLITAN BOARD OF WORKS.—At the meeting on Friday last, the Parliamentary Committee, to whom the memorial from tradesmen in the Borough, presented at the previous meeting, was referred, made a report, stating that with regard to the request that the Board would take measures for readjusting the charges for water in the Metropolis, and for providing for the supply by meter to places of business, that the memorialists should be informed that the Board were not in a position at the present time to take any measures in the direction indicated in the memorial. A letter was read from the Chairman of the meeting of delegates, stating that a Committee appointed by them were desirous of an interview with the Parliamentary Committee, to confer with them as to the necessity of delaying the progress of the Board's Water Supply Bills until the opinion of the ratepayers has been expressed. The communication was referred to the Parliamentary Committee, with power to receive a deputation.

The Registrar-General publishes the following returns of the average daily quantity of water supplied by the London Water Companies during the month of January, 1878. According to these, 117,475,799 gallons, or 533,746 cubic mètres of water (equal to about as many *tuns* by measure, *tons* by weight) were supplied daily; or 217 gallons (98·6 decalitres), rather less than a *ton* by weight, to each house, and 30·6 gallons (13·9 decalitres) to each person, against 29·8 gallons during January, 1877.

COMPANIES.	Number of Houses, &c., supplied in Jan., 1877.	Number of Houses, &c., supplied in Jan., 1878.	Aver. Daily Supply of Water in Gallons* during Jan., 1877.	Aver. Daily Supply of Water in Gallons* during Jan., 1878.
Total supply	530,464	541,265	112,205,619	117,475,799
From Thames	247,965	254,512	56,521,086	58,480,063
„ Lea and other Sources	282,499	286,753	55,684,533	58,995,736
THAMES.				
Chelsea	28,737	28,859	6,869,000	7,439,200
West Middlesex	48,762	50,200	9,290,314	8,986,942
Southwark and Vauxhall	77,800	79,567	17,500,000	18,100,000
Grand Junction	37,055	37,910	10,858,962	11,012,121
Lambeth	55,611	57,976	12,002,800	12,941,800
LEA AND OTHER SOURCES.				
New River	125,100	126,178	25,192,000	26,198,000
East London	111,967	115,143	23,902,000	26,033,800
Kent	45,432	45,432	6,590,533	6,763,936

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for January, 1878, as compared with that for the corresponding month of 1877, shows an increase of 10,801 houses, and of 5,270,180 gallons of water supplied daily.

Dr. Frankland reports as the result of his analyses of the waters supplied to the Metropolis and some of its suburbs during January, that, taking unity to represent the average amount of organic impurity in a given volume of the Kent Company's water during the last nine years, the proportional amount of such impurity in an equal volume of water supplied by each of the other Companies, and by the Tottenham Local Board of Health, was—Tottenham 1·1, Colne Valley 1·1, Kent 1·7, Grand Junction (filtered through spongy iron) 2·2, New River 3·4, East London 3·9, Lambeth 4·5, Southwark 5·2, Chelsea 5·2, West Middlesex 5·9, and Grand Junction 6·3. The water drawn from the Thames by the Chelsea, West Middlesex, Grand Junction, Southwark, and Lambeth Companies was again much polluted by organic matter, and was quite unfit for dietetic purposes, even after the efficient filtration to which it had been subjected before delivery. By filtration by spongy iron, however, the proportion of organic matter was reduced to about one-third, and the hardness to little more than one-half of its original amount. The spongy iron filter had continuously supplied all the drinking water to a family of eleven persons for more than a year, and the sample was drawn from it just before the renewal of the spongy iron. The water of the Lea, though efficiently filtered by the New River and East London Companies, was considerably polluted by organic matter in solution. The only samples of good water examined in January were obtained from deep wells in the chalk. This water was supplied by the Kent and Colne Valley Companies, and by the Tottenham Local Board of Health. It was clear, colourless, palatable, and of most excellent quality for dietetic purposes. That portion of it distributed by the Colne Valley Company, having been softened by Clark's process, was well adapted for washing. Seen through a stratum two feet deep, the water supplied by the Kent and Colne Valley Companies, the Tottenham Local Board, and the Grand Junction Company (after filtration through spongy iron) was clear and colourless; the New River and East London Company's water was clear and nearly colourless; that distributed by the Chelsea, West Middlesex, Southwark, and Lambeth Companies, clear and pale yellow; and that by the Grand Junction Company, clear and yellow.

Results of Analysis expressed in Parts per 100,000.

Companies or Local Authorities.	Total Solid Matters.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen, as Nitrates and Nitrites.	Total combined Nitrogen.	Chlorine.	Total Hardness.
Inner Circle.								
Thames—								
Chelsea	29·84	·265	·041	0	·212	·283	1·65	20·6
West Middlesex	30·46	·311	·040	0	·238	·278	1·65	20·3
Southwark and Vauxhall	31·10	·270	·034	0	·263	·297	1·60	21·8
Grand Junction	30·39	·325	·047	0	·241	·288	1·60	20·1
Ditto, after filtration through spongy iron	18·42	·092	·040	·007	·119	·165	1·60	11·1
Lambeth	32·44	·230	·036	0	·291	·327	1·65	22·8
Other Sources—								
New River	30·78	·175	·028	0	·393	·421	1·60	22·4
East London	34·64	·194	·038	0	·331	·369	2·00	23·9
Kent	41·88	·080	·023	0	·533	·556	2·55	29·4
Outer Circle.								
Colne Valley	12·14	·051	·015	0	·332	·347	1·35	4·8
Tottenham Bd. of Health	45·68	·052	·011	0	·488	·499	3·40	26·5
Corporation of Birmingham*	26·30	·218	·079	·004	·311	·423	1·9	16·0
Corporation of Glasgow†	3·10	·215	·021	0	·005	·026	0·53	1·2

* Analyzed by Dr. Alfred Hill, Medical Officer of Health and Analyst to the Borough.
† Analyzed by Dr. E. J. Mills, F.R.S., of Anderson's College, Glasgow.

Note.—The numbers in the analytical table can be converted into grains per imperial gallon by multiplying them by seven, and then moving the decimal point one place to the left. The same operation transforms the hardness in the table into degrees of hardness on Clark's scale.

Dr. Whitmore's report on the composition of Thames Companies and other waters consumed in Marylebone during January:—

	In Grains, per Gallon.			In Parts, per Million.		In Degrees.	
	Total Solid Matter.	Loss by Incineration.*	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Hardness.	Hardness after boiling Fifteen Minutes.
West Middlesex	20·00	0·96	1·04	0·02	0·06	14·0	3·0
Grand Junction	21·28	0·96	1·10	0·02	0·07	14·7	3·3

* The loss by incineration represents the amount of organic and other volatile matters contained in the Imperial gallon (70,000 grains) of water. The total solid matter, *minus* such loss, consisted principally of carbonate of lime, with small quantities of other equally harmless salts.

The water of both Companies, as drawn from the mains, when seen through a glass tube, showing a volume of water two feet in thickness, was clear, bright, and nearly colourless. The water taken from the Thames at Hampton was turbid.

WATER SUPPLY OF TOWNS.

His Royal Highness the Prince of Wales, President of the Society of Arts, has addressed the following letter to the Council of that body:—

"*Clarence House, St. James's, S.W., Jan.* 30, 1878.

"To the Chairman of the Council of the Society of Arts.

"Sir,—The supply of pure water to the population is at the present time exciting deep interest throughout the country. Our great cities and populous towns, such as Manchester, Liverpool, Birmingham, and others, are, each for itself, taking steps to obtain an improved and increased supply, whilst the Metropolis is seeking further powers from the Legislature with the same object in view. The smaller towns and villages are dependent upon accidental sources of supply, and in many instances these are wholly inadequate for health and comfort. While the larger populations are striving, each independently and at enormous cost, to secure for themselves this article of prime necessity, the smaller localities must make the best shift they can, and in many instances are all but without supply at all.

"Under these circumstances, I would draw the attention of the Council to the subject, and suggest whether, at the present time, great public good would not arise from an open discussion of the question in the Society's rooms, with a view to the consideration of how far the great natural resources of the kingdom might, by some large and comprehensive scheme of a national character, adapted to the varying specialities and wants of districts, be turned to account, for the benefit, not merely of a few large centres of population, but for the advantage of the general body of the nation at large.—I have the honour to be, Sir, yours faithfully,

(Signed) "Albert Edward P.,
"President of the Society of Arts."

This communication was laid before the Council at their last meeting, and it was resolved that a Committee be formed to consider the best means of carrying into effect the proposition of the Prince of Wales, and that the Secretary be desired to inform His Royal Highness that the Council would take immediate steps to secure the discussion of the subject as suggested.

The following is the reply sent in accordance with these instructions:—

"*Society of Arts, John Street, Adelphi, W.C., Feb.* 13, 1878.

"Sir,—I am directed by the Council of this Society to acknowledge the receipt of your Royal Highness's letter of the 30th of January, addressed to the Chairman, and to express to your Royal Highness their high estimation of the importance of the subject which your Royal Highness has brought to their consideration. It will afford the Council much gratification to carry out your Royal Highness's most valuable suggestion, and they will at once take steps for securing a public discussion on this subject.—I have the honour to be, Sir, your Royal Highness's most obedient servant, (Signed) "P. Le Neve Foster, Secretary."

THE GASLIGHT AND COKE COMPANY.

The Half-Yearly Ordinary General Meeting of the Proprietors of this Company was held at the Office, Horseferry Road, Westminster, on Friday last, the 15th inst.—the Hon. Howe Browne, the Governor, presiding.

The Secretary (Mr. J. O. Phillips) read the advertisement convening the meeting, and the corporate seal was affixed to the register.

Mr. Baddeley asked how many Shareholders there were in the Company.

The Governor: Eight thousand.

The Secretary read the minutes of the last half-yearly general meeting, which were approved.

The following report and statements of account were submitted:—

The period embraced by the accounts which the Directors now submit to the Proprietors has, with slight exception, been of an uneventful character, and has been marked chiefly by steady progress and prosperity. The Company are bound, under penalties, to supply gas of a fixed illuminating power; and the faithfulness with which its duty to the public has been performed is evidenced by the fact that, during a period of seven years, no forfeiture has been incurred. On a recent occasion, however, and owing to circumstances which the Directors have been unable to trace to their origin, the gas delivered from one of their stations was reported by the Government Testing Officer as being deficient in the required illuminating power. The Chief Gas Examiner, from whose decision there is no appeal, having confirmed the report of the Testing Officer, the result has been that, on a prosecution of the Company being instituted by the Metropolitan Board of Works, a fine of £74 has been imposed, which the Company's Act requires "shall be borne and paid by and out of the divisible profits of the Company, and by way of reduction of dividend."

After meeting all charges, and devoting to the wear and tear of the half year such sum as in the judgment of the Directors is necessary for the maintenance of all plant in a proper state of efficiency, and after providing for interest on debenture and other preference capitals, and for maximum parliamentary dividends on the B and H stocks, there remains a profit of £258,297 1s. 6d., which added to the sum of £68,239 14s. 8d., brought from the last account, shows a total sum of £326,536 16s. 2d. applicable to dividend on the ordinary stock of the Company. Out of this amount the Directors recommend the appropriation of £201,865, first, to the liquidation of the above-mentioned fine, and second to the payment to ordinary shareholders of a dividend at the rate of 10 per cent. per annum. The balance enables the Directors to place to the credit of their reserve-fund the authorized contribution of £30,640 19s. 6d., and to carry forward a surplus of £91,030 16s. 8d.

The Directors have only to add that, as announced verbally at the last half-yearly general meeting, they have resolved upon the exercise of their parliamentry powers to manufacture their own products, and that the works necessary for the purpose are now in course of construction at Beckton.

No. 1.—STATEMENT OF STOCK AND SHARE CAPITAL, *on Dec.* 31, 1877.

Acts of Parliament relating to the raising of Capital.	Description of Capital.	Standard Dividend.	Number of Shares issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Arrears of Calls.	Remaining to be called up and unissued.	Total Amount authorized.
									£
The Gaslight and Coke Company's Act, 1868	A Ordinary stock	10 per cent.	..	..	..	£1,535,820	..	..	
	A Preference convertible stock, 1st issue	5 ,,	..	..	..	2,140	..	..	
	Ditto, 2nd issue	Ditto.	..	..	..	2,530	..	..	1,550,000
	A Preference convertible shares, 3rd issue	Ditto.	951	£10	£10	9,510	..	..	
The Gaslight and Coke Company's Act, 1872	Ditto, 4th issue	Ditto.	50,000	10	10	500,000	..	..	
	Ditto, 5th issue	Ditto.	50,000	10	4	198,854	£1146	£300,000	1,000,000
The Victoria Docks Gas Act, 1857	A Ordinary stock	10 per cent.	..	..	..	100,000	..	..	100,000
The City of London Gas Company's Act, 1859	A ,, ,,	Ditto.	..	..	..	300,000	..	..	
	B Stock	4 per cent.	..	..	..	100,000	..	..	400,000
The Companies Act, 1862, as applied to the Western Gaslight Company, Limited	A Ordinary stock	10 ,,	..	..	..	600,000	..	..	600,000
The Imperial Gas Act, 1854	A ,, ,,	Ditto.	..	..	..	1,560,000	..	..	1,560,000
The Great Central Gas Consumers Act, 1851	C Preference stock	Ditto.	..	..	..	200,000	..	..	200,000
The Equitable Gaslight Company's Act, 1842	D ,, ,,	Ditto.	..	..	..	300,000	..	..	300,000
	E ,, ,,	Ditto.	..	..	..	165,000	..	..	
The Independent Gaslight and Coke Co.'s Act, 1864	F ,, ,,	5 per cent.	..	..	..	30,000	..	..	
	G ,, ,,	7½ ,,	..	..	..	60,000	..	..	255,000
The Imperial Gas Act, 1866	H Stock	7 ,,	..	..	..	325,000	..	..	325,000
The Imperial Gas Act, 1869	Ditto	Ditto.	..	..	..	975,000	..	..	975,000
The Gaslight and Coke Company's Act, 1876	..	10 per cent.	..	..	..	..	..	1,000,000	1,000,000
						£6,963,854	£1146	£1,300,000	£8,265,000

No. 2.—STATEMENT OF LOAN CAPITAL.

Acts of Parliament authorizing the Loan Capital.	Total Amount authorized.	Description of Loan.	Rates per Cent. of Interest. 4 per Cent.	4½ per Cent.	4¾ per Cent.	4½ per Cent.	10 per Cent.	Total Amount borrowed.	Remaining to be borrowed.
The Gaslight and Coke Company's Act, 1868	£462,500	Debentures.	£6,300	£20,000	£110,000	£500,650	..	£1,436,500	£125,000
The City of London Gas Company's Act, 1859	60,000	Debenture stock.	354,200	..	50,000	265,350	..		
The Great Central Gas Consumers Act, 1851	66,000	Bonds for capitalized profits.	..	..	..	..	£130,000		
The Victoria Docks Gas Act, 1857	25,000								
The Companies Act, 1862, as applied to the Western Gaslight Company, Limited	200,000								
The Imperial Gas Act, 1854	173,000								
The Imperial Gas Act, 1866	81,250								
The Imperial Gas Act, 1869	243,750								
The Gaslight and Coke Company's Act, 1872	250,000								
The Gaslight and Coke Company's Act, 1876	1,000,000	..	..	..	..	..	..	..	1,000,000
	£2,561,500		£360,500	£20,000	£160,000	£766,000	£130,000	£1,436,500	£1,125,000

No. 3.—CAPITAL ACCOUNT.

Dr. *Cr.*

	Expended this Half Year.	Total Expenditure to Dec. 31, 1877.		Receipts to June 30, 1877.	Received since that date.	Total Receipts to Dec. 31, 1877.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
To Expenditure to June 30, 1877	..	7,782,275 4 5	By A Ordinary stock	4,094,840 0 0		4,095,820 0 0
Expenditure during half year to Dec. 31, 1877—viz.:			A 5 per cent. preference convertible stock	2,140 0 0	..	2,140 0 0
Lands acquired, including law charges	15,142 11 8		A 5 per cent. preference convertible stock, 2nd issue	*2,940 0 0	..	2,530 0 0
Buildings and machinery in extension of works	145,439 4 1		A 5 per cent. preference shares, 3rd issue	*10,080 0 0	..	9,510 0 0
New and additional mains and service-pipes	29,257 11 6		A 5 per cent. preference shares, 4th issue	300,000 0 0	200,000 0 0	500,000 0 0
New and additional meters	7,222 9 6	197,061 16 9	A 5 per cent. preference shares, 5th issue	100,000 0 0	98,854 0 0	198,854 0 0
			B 4 per cent. maximum stock	100,000 0 0	..	100,000 0 0
			C 10 per cent. preference stock	200,000 0 0	..	200,000 0 0
			D 10 „ „ „	300,000 0 0	..	300,000 0 0
			E 10 „ „ „	165,000 0 0	..	165,000 0 0
			F 5 „ „ „	30,000 0 0	..	30,000 0 0
			G 7½ „ „ „	60,000 0 0	..	60,000 0 0
			H 7 per cent. maximum stock	1,300,000 0 0	..	1,300,000 0 0
			Debentures	+706,950 0 0	..	636,950 0 0
			Debenture stock, 4½ per cent.	265,350 0 0	..	265,350 0 0
			„ „ 4¾ „	50,000 0 0	..	50,000 0 0
			„ „ 4 „	+284,200 0 0	..	354,200 0 0
			Bonds for capitalized profits	130,000 0 0	..	130,000 0 0
				8,101,500 0 0	298,854 0 0	
	7,979,337 1 2					
To Balance of capital account	421,016 18 10					
	8,400,354 0 0					8,400,354 0 0

* £980 of these issues have been converted into ordinary stock during the half year.

† Debentures, amounting to £70,000, have been exchanged for debenture stock during the half year.

No. 4.—REVENUE ACCOUNT.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Manufacture of gas—			By Sale of gas—		
Coals, including dues, carriage, unloading, and trimming (see Account No. 9)	407,736 8 11		Common gas, per meter, at 3s. 6d. per 1000 cubic feet	775,386 0 2	
Salaries of engineers and other officers at works	6,185 8 4		Cannel gas, per meter, at 4s. 4d. per 1000 cubic feet	48,060 11 6	
Wages (carbonizing)	73,904 4 6		Cannel gas, sold in bulk, at 3s. 5d. per 1000 cubic feet	4,199 0 1	
Purification, including £11,131 6s. 2d. for labour	17,821 15 0		Public lighting and under contracts—		
Repair and maintenance of works and plant, materials and labour; less received for old materials, £2018 17s. 5d.	112,084 12 3		Common gas	60,145 15 7	
		617,732 9 0	Cannel gas	4,934 10 8	
Distribution of gas—			(see Statement No. 11)		892,725 18 0
Salaries and wages of officers (including rental clerks)	17,161 11 7		Rental of meters	..	17,137 19 6
Repair, maintenance, and renewal of mains and service-pipes	20,922 10 1		Residual products—		
Repairs and renewals of meters	14,054 13 2		Coke, less £18,312 5s. 9d. for labour, &c.	145,866 2 10	
		52,138 14 10	Breeze, less £1755 7s. 10d. for ditto	1,754 6 11	
Public lamps—			Tar, less £282 16s. 9d. for ditto	46,847 6 2	
Lighting and repairing	..	11,068 15 9	Ammoniacal liquor, less £297 9s. 6d. for ditto	45,397 14 3	
					239,865 10 2
Rents, rates, and taxes—			Rents receivable	..	2,319 2 2
Rents payable	4,917 19 7		Transfer fees	..	217 10 0
Rates and taxes	27,901 0 1		Canteen account	..	179 11 1
		32,818 19 8			
Management—					
Directors allowance	3,750 0 0				
Company's auditors	250 0 0				
Salaries of secretary, accountant, and clerks	5,451 10 10				
Collectors commission	11,607 1 8				
Stationery and printing	4,629 3 5				
General charges	1,649 13 6				
		27,337 9 5			
Law charges	..	4,921 12 0			
Parliamentary charges	..	9 13 2			
Bad debts	..	3,921 12 2			
Depreciation-fund, for works on leasehold lands	..	750 0 0			
Superannuation allowances under amalgamation schemes, and annuities	..	8,604 14 4			
Public officers—					
Gas referees and official auditor	969 16 4				
Public testing-stations	181 16 4				
		1,151 12 8			
		760,455 13 0			
Balance carried to net revenue account (No. 5)	..	391,989 17 11			
		1,152,445 10 11			1,152,445 10 11

No. 5.—NET REVENUE ACCOUNT.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Interest on debentures, debenture stocks, and bonds, accrued to Dec. 31, 1877	..	31,772 8 9	By Balance from last account	272,981 14 8	
Dividend on A 5 per cent. preference shares and stock	14,521 3 4		Less dividend on ordinary capital for the half year to June 30, 1877	204,742 0 0	
Dividend on B stock, at 4 per cent.	2,000 0 0				68,239 14 8
„ C „ 10 „	10,000 0 0		Revenue account (No. 4)	..	391,989 17 11
„ D „ 10 „	15,000 0 0		Dividend from the estate of Benjamin Higgs	..	63 8 0
„ E „ 10 „	8,250 0 0				
„ F „ 5 „	750 0 0				
„ G „ 7½ „	2,250 0 0				
„ H „ 7 „	45,500 0 0				
		98,271 3 4			
Interest on temporary loans	..	712 12 4			
Balance applicable to dividend on the ordinary stock	..	326,536 16 2			
		460,293 0 7			460,293 0 7

No. 6.—RESERVE-FUND ACCOUNT.

Balance, Dec. 31, 1877	£103,382 5 4	Balance, June 30, 1877	£101,753 5 2
		Interest on amount invested	1,629 0 2
	£103,382 5 4		£103,382 5 4

No. 7.—INSURANCE-FUND ACCOUNT.

Balance, Dec. 31, 1877	£71,973 11 7	Balance, June 30, 1877	£70,852 3 2
		Interest on amount invested	1,121 8 5
	£71,973 11 7		£71,973 11 7

No. 8.—DEPRECIATION-FUND ACCOUNT (FOR WORKS ON LEASEHOLD LANDS).

Balance, Dec. 31, 1877	£9,704 9 6	Balance, June 30, 1877	£8,827 19 7
		Amount brought from revenue account for the half year	750 0 0
		Interest on amount invested	126 9 11
	£9,704 9 6		£9,704 9 6

No. 9.—STATEMENT OF COALS USED, ETC.

Description of Coal.	In Store, June 30, 1877.	Received during Half Year.	Carbonized during Half Year.	Used during Half Year.	In Store, Dec. 31, 1877.
	Tons.	Tons.	Tons.	Tons.	Tons.
Common	71,284	539,332	492,079	327	118,210
Cannel	18,339	28,716	29,461	..	17,594

No. 10.—STATEMENT OF RESIDUAL PRODUCTS.

Description of Residual.	In Store, June 30, 1877.	Made during Half Year.	Used in Manufacture during Half Year.	Sold during Half Year.	In Store, Dec. 31, 1877.
Coke—chaldrons	32,917	491,989	135,678	347,506	41,752
Breeze—chaldrons	745	47,624	..	46,705	1,664
Tar—gallons	1,442,452	5,248,731	..	5,359,650	1,331,533
Ammoniacal liquor—butts of 108 gallons	4,550	151,290	..	146,026	9,814

No. 11.—STATEMENT OF GAS MADE, SOLD, ETC.

Description of Gas.	Quantity Made (part measured).	Quantity Sold. Public Lights and under Contracts (estimated).	Quantity Sold. Private Lights (per Meter).	Quantity Sold. Total Quantity Sold.	Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lamps.
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	5,128,250	289,565	4,430,777	4,720,342	61,682	4,782,024	346,226	31,464
Cannel	276,948	17,754	*246,398	264,152	1,326	265,478	11,470	3,380

* This includes the quantity sold in bulk.

GENERAL BALANCE-SHEET.

	£ s. d.		£ s. d.	£ s. d.
To Capital—		By Cash at bankers	..	76,244 13 11
Balance at credit thereof (Account No. 3)	421,016 18 10	Amount invested—		
Net revenue—		Reduced Three per Cent. Consols	103,382 5 4	
Balance at credit thereof (Account No. 5)	326,536 16 2	Three per Cent. Consols	71,973 11 7	
Reserve-fund account—		New Three per Cent. Consols	9,704 9 6	
Balance at credit thereof (Account No. 6)	103,382 5 4			185,060 6 5
Insurance-fund account—		Stores on hand, viz.—		
Balance at credit thereof (Account No. 7)	71,973 11 7	Coals	118,780 19 10	
Depreciation-fund account—		Coke	15,196 11 0	
Balance at credit thereof (Account No. 8)	9,704 9 6	Tar and ammoniacal liquor	14,500 6 9	
Debenture interest for amount due to Dec. 31, 1877	26,381 6 11	Sundry stores	99,752 6 11	
Bond interest for amount due to ditto	6,500 0 0			218,230 4 6
Preference dividends for amount due to ditto	98,271 3 4	Accounts due to the Company, viz.—		
Unclaimed dividends	5,757 0 7	Gas and meter rental—		
Sundry tradesmen and others, for amount due for coals, stores, and sundries	156,651 0 1	Quarter ending Dec. 31, 1877	632,277 5 2	
Benevolent-fund	1,552 4 0	Arrears outstanding	10,010 11 9	
Debenture stock subscriptions	51,090 0 0			642,287 16 11
		Coke and other residual products	57,837 3 5	
		Sundry accounts	40,614 11 2	
				98,451 14 7
		Retiring allowances	..	28,542 0 0
	1,278,816 16 4			1,278,816 16 4

(Signed) RICHARD HOWE BROWNE, Governor.

Examined and found correct, Jan. 30, 1878. (Signed) J. SALE BARKER, H. W. CHISHOLM, T. J. BRIGGS, FRANCIS FARNAN, Auditors.

I certify that the above accounts are correct. A forfeiture incurred during the half year, amounting to £74, must be borne and paid exclusively by and out of the divisible profits of the Company, and by way of reduction of dividend.

Feb. 1, 1878. (Signed) CHAS. H. PARKES, Official Auditor.

The GOVERNOR: Gentlemen, it now becomes my duty to move the adoption of the report and statements of account which are in your hands, and to which, no doubt, you have already given considerable attention. In doing so, I must, in the first place, express the pleasure I feel in seeing so large an attendance here to-day, and also the hope that I shall be able to make myself more clearly audible than it was my unfortunate fate at the last general meeting to do. We have altered the situation of the platform, and I think probably from that circumstance, and the different arrangement made as to the drapery of this large hall, you will be better able to hear me than you could do on the last occasion. Gentlemen, I shall have very few remarks to make upon the report itself. It is very short; but there are one or two points in it which require a little attention from the proprietors. And, first of all, as to the fine which has been levied upon us, for a very small offence, at the instance of the Metropolitan Board of Works. That offence, as mentioned in the report, was a want of illuminating power in the gas supplied from one of our stations during a very short period. We have been unable ourselves exactly to account for the cause of that decrease; it was not perceptible at the station itself, and must have taken place between the station and the testing office. At that office, however, the gas was found by the Examiner to be one candle deficient in illuminating power, and our worthy friends, the Metropolitan Board of Works, seized upon the opportunity to inflict upon us a fine of £74. Now, I am not going to express a very strong opinion upon the conduct of the Metropolitan Board in instituting these proceedings. I merely state the fact to the proprietors; but I cannot help thinking that, after having served the City of London and the Metropolis generally for seven years, without on any single occasion having rendered ourselves liable to an indictment of this kind, for want of illuminating power in our gas, it is a very miserable and paltry proceeding on the part of a great body like the Metropolitan Board, to take the advantage they did of us on this occasion. I wish also to state that, during the seven years we have been supplying something like two-thirds of the Metropolis, we have been giving the consumers, and the public generally, gas of an illuminating power fully one candle above the requirements of our Act of Parliament—an excess, the value of which worked out in money, as I have had it done, would astonish you. We are not paid for that excess, and we get no credit for it from the Metropolitan Board. I may mention, in reference to the instance in which we were recently fined, that the Magistrate who tried the case, marked his sense of the unfairness, or, rather, the paltriness, of the whole proceeding, and inflicted a strong rebuke upon the Metropolitan Board, who applied to be paid their costs, amounting to £10, by awarding them 2s. only. Now, gentlemen, the next point in the report to which I wish to allude, is the apparently very large balance which we are carrying over to the next account. And here I may say that, on the first occasion upon which the amalgamated Company met here, I clearly enunciated the policy which was then most warmly received by the proprietors as the policy for the future—viz., in the first place to accumulate as large a reserve-fund as we are enabled to do under our Act; and, secondly, not to increase our dividends beyond 10 per cent. until we had thus established a satisfactory reserve. Suggestions have been made that we should increase our dividends, or that we should pay the dividends clear of income-tax, and not carry over so large a surplus on this occasion. But I wish to mention to the proprietors that in the next year—1879—and in the succeeding year—1880—we shall be called upon to pay a very largely increased dividend on the fourth and fifth issues of our convertible shares, which will then come in and rank with the ordinary 10 per cent. A stock. This will entail upon us an amount of, say, £50,000 in the two years, and to provide against that, and keep us in a proper working condition, the Board are unanimous in suggesting to you that the accounts, as rendered to you, should stand, and that the amount to be carried forward should remain as it is. Now, gentlemen, going away from the report, I may mention to you that this Company have been indicted for creating a nuisance with their spent lime at the Bromley station, and an injunction was obtained against us, from Justice Fry, to restrain the manufacture of gas there under certain conditions, but the execution of the injunction was stayed for three months, with the understanding on the part of the Company that we should take every means in our power to mitigate that nuisance, and entirely to obviate it if possible. The principal ground upon which the injunction was given was the importation into that station of spent lime from other stations, which certainly caused a nuisance, and it must be confessed that, after our contentions in Parliament last session, we had a very lame defence to the action. We were, therefore, very glad to accept the conditions imposed by Justice Fry, who stayed the injunction for three months. During that period I have great pleasure in stating the gratifying fact to the proprietors that we have introduced at that station a new system of purification of the spent lime, which has completely removed the nuisance. During these three months we have had but three complaints, two of which were completely groundless, and the third may be traceable to other sources than our works, so that I believe I may say with confidence that we shall hear no more of this matter. The period during which the injunction was suspended ceases to-morrow. I wish it had been yesterday, for then I should have had the pleasure of announcing that the question was now altogether at an end. In reference to this question of purification, I hope the day is not very far distant when we may congratulate ourselves on the total disuse of lime, or its almost total disuse, as a purifying agent. I am not in a position at the present moment to state, nor would I state it without further experience, the result of experiments now going on in the works of this Company for bringing about a completely new system of purification from sulphur. But I hope at the next meeting to be able to do so. Our position at the present moment is this—that, having already seen it experimentally tried, we have now determined to put one of our stations completely under this new system, and in a very few days the station I allude to—Silvertown—will be adopting entirely the new process. Hitherto it has given us every promise of success, and I believe firmly, having seen it frequently myself—the other members of the Board also believe with me—that it will prove a most

valuable and important improvement, so that by-and-by we may hope to be able to avert any kind of indictment for nuisance arising from the use of lime on our works. It will also be a much more economical process than that which is now in operation. The tar and sulphur works at Beckton have been commenced, and we trust they will be productive of great profit to this Company. We do not anticipate for the first year or two that they will be as remunerative as they will be afterwards, on account of the opposition we may have to meet with, but ultimately, I have no doubt in my own mind, and I believe no doubt exists in the minds of the majority of our Board, that a considerable profit will accrue to the Company from the utilization and manufacture of our own products by ourselves. Now, the next point I allude to is a most important one. It is not mentioned in the report, because it was thought better to leave it to me to explain to the proprietors to-day. I refer to the action which was brought by Mr. Patterson against this Company as long ago as the year 1873. Having been a Gas Referee, and consequently having access to all our works, and being able to investigate all our processes, he discovered, or fancied he discovered, some improvement in the mode of purifying gas, for which he took out a patent. If he had succeeded in establishing that patent, he would have been able to inflict upon us an enormous expense in the shape of royalties for the use of the process. As it is, he has put us to an enormous expense. In the first place, he brought an action against us for the infringement of his patent, which was tried before Vice-Chancellor Bacon, who gave everything in his favour. Advised, as we were, by the very best counsel we could possibly engage—viz., Mr. Southgate and Mr. Horace Davey—we appealed against that decision to the Lords Justices of Appeal. Those learned judges, the highest in their profession, gave every single point in our favour, thus reversing the decision of Vice-Chancellor Bacon, and they gave the costs in our favour. A year, or perhaps more than a year, was then allowed to Mr. Patterson to bring this matter forward again before the House of Lords, thus inflicting additional expense upon the Company, for he was allowed to sue us before that tribunal *in formâ pauperis*—*i.e.*, he conducted his own case, and was not subject to any costs whatever, whereas we, as a Company, were obliged to employ the very best counsel we could get (who were the same that we had before) to defend our rights. I am glad, however, to inform you that the decision of the House of Lords was unanimously in favour of this Company, although, under the circumstances, we are mulcted in the costs of these actions—which I call most unrighteous actions—to the extent of £12,065! The balance of that amount is charged in the present accounts; and, therefore, we do not owe one shilling on that behalf. The costs also of the West Ham prosecution are included in the present accounts, where law charges figure in the sum of £4921. We have done now, I hope, with Mr. Patterson for ever, and I think the proprietors will agree that we, the Directors, have taken the soundest possible course in resisting his claim to the uttermost. If we had not succeeded in our resistance, it would have entailed upon us an amount of annual expense which I could hardly estimate, considering the vast operations of the Company, and, therefore, we may congratulate ourselves that, as far as this matter is concerned, we are out of the wood. Now, gentlemen, having troubled you at such great length at the last meeting on the subject of the electric light, I am almost afraid to venture upon any further observations with regard to it to-day. I may say, however, that at Christmas last, for my own information and satisfaction, I went to Paris, and saw the whole operation of the electric light as there manufactured. Since then I have been requested, by a letter from the gentlemen who so very courteously and so very graciously received me there—the patentees of the light—to express my opinion as to its applicability in the sense of its chance of superseding illumination by coal gas. I replied to their communication by saying that I should certainly allude to it in my address to-day, out of compliment to them, for they fully deserve it; and I told them at the same time that the result of my experience and observation in Paris was not to change the opinion I had originally formed upon this very important question. I told them that the same objection to the system still existed in my mind—viz., the difficulty attending the distribution of the light. There is no doubt in the world it is a beautiful and splendid light; but its intensity is so great that I do not think it can ever come into general use in dwelling-houses. But, while saying this, I will not conceal the fact that great improvements are being made in the light, and I should be the very last person in the world to deprive those gentlemen of the praise which is due to them for the great improvements they have effected. The light which I witnessed in Paris is a different light from that which I described at the last meeting. It is not Jablochkoff's light; it is a light which dispenses with the use of a candle, and this, in itself, is a great improvement. These gentlemen showed me everything, from the beginning to the end, in their laboratory, a very large apartment, where there was a large assemblage of scientific men, and where they took every possible pains to explain the machinery and the light itself, down to the very last point. My great objection to the light is that it is not a flame; it is a succession of sparks, which are most dazzling to the eyes, and very painful, as I afterwards experienced. But for some purposes I do not hesitate to state that it will be applicable. I think it will be applicable in a shape that will not at all interfere with, but rather augment, the profits of gas companies, because the production of this light necessitates the employment of power, which power cannot in any way be so inexpensively obtained as by the use of a gas-engine. They told me so in Paris; they said, "Though we may seem to interfere with you, we shall, in fact, be your best customers." I say that in some cases, as in the illumination of large open spaces, this light may succeed. In lighthouses it ought to be used, as it is a remarkably brilliant light. There is a very curious circumstance in connection with this light, which I took the trouble to satisfy myself about when in Paris. It is this—that after having stood under one of these electric lights, if you go and stand under a gas-lamp, you can read better beneath the latter than the former. On Christmas-day last I satisfied myself on this point, and I found that though from the Place Vendôme I could see with the greatest possible distinctness every other lamp, still when I came near the electric light I could not distinguish the print of a newspaper at all better than when under a gas-lamp. I am quite sure I wish these gentlemen every success in their invention. They do not at all contemplate, as they told me, that they will interfere with gas illumination; and, for my own part, I believe that as to its applicability in private houses it is perfectly impossible. Now, passing from these subjects, I wish to call attention to the present state of the working of this Company. At our last meeting I think I used the expression that, since my connection with the Chartered Company, I had never known it to be in a more progressively improving condition than it then was. I am glad to say that since that time the statement I then made has been fully carried out and realized. I will just read a few statistics to show how we are going on. During the half year ending December last we carbonized 521,540 tons of coal, and during the whole of 1877 we carbonized 1,051,323 tons. We have now brought our working to that state, I may almost say of perfection (for you cannot get out of a ton of coal more than a ton of coal contains) that the gas made per ton of coal carbonized at all our stations during the December half year was 10,364 cubic feet. I do not think that state of things can be equalled by any other Company in existence. As compared with our make in 1876, which was 10,140 feet per ton, there was an improvement and increase to the extent of 220 feet per ton. I think this reflects the greatest possible credit upon our engineers, and it shows the very strict vigilance which the Board maintain as to the working of every station. At some stations, of course, there are discrepancies, but these are accounted for by the position of the stations themselves, and from their relative antiquity or newness of construction, and more particularly with reference to the delivery of coals into those stations. For instance, at Beckton, we show the extraordinary result of 10,800 feet of gas produced per ton of coal. This, of course, merges in the average of all the stations which are not so good as Beckton. Bromley and Beckton are peculiarly well situated for getting coal newly wrought from the pits, and naturally the production of those stations is in a greater degree than that of other stations in less favourable positions. But, on the whole, I think, when I state that the average of all the stations amounts to 10,364 feet of gas per ton, it must be considered satisfactory by the proprietors. Now as to the amount of gas sold. We realized 92·21 per cent., which is an extraordinary result. We used upon our stations 1·17 per cent. Our loss by unaccounted-for gas last half year was somewhat—but only to a small degree—higher than in the previous period; and for this reason—that during the last half year, as every one knows, there have been great changes in the City, in the pulling down of streets, and the discontinuance of lights from that cause, and this has tended to increase the amount of our unaccounted-for gas. But after all it was only increased from 6·54 to 6·62 per cent., which is a very small item. The average price of coke has been, as we expected, decreased on account of the continued mildness of the weather, there having been almost a glut of coke in the London market. I do not suppose any Company ever experienced two such mild winters as we have passed through, and consequently the price of coke has diminished. The bad debts of this Company are only ·43 per cent. on the rental—*i.e.*, about 9s. in the £100—which, I think, is highly satisfactory, and reflects great credit on the mode of collection we have adopted. The increase in the gas sold during the half year is close upon 6 per cent., and I am sure it would have been greater had it not been for the extraordinary depression in trade which every one hears of, and which exceeds in intensity that of any former period in our memories, and has continued for a much longer space of time. It is prevalent throughout the whole country in every department of business, and, therefore, I think it is very satisfactory that this Company are able to show an increase in the per centage of gas sold to their consumers, equal to what it was my duty once to give evidence upon in the House of Lords, when I stated that the annual increase in the consumption of gas was between 5 and 6 per cent. This, I think, is highly satisfactory, considering that the price of gas has been diminished during the year. As regards the future, I feel that I may speak with a tolerable degree of certainty. The Directors have been enabled to make very fair contracts for their coals during the coming year, and I believe we shall have to congratulate ourselves at the close that those contracts have been very beneficial to the Company. I will not mention the exact price at which we have made contracts, because I do not think it desirable to do so. I may now just refer to the future calls to be made upon our fifth issue. You are aware that the calls on the fourth issue are now completed. The full amount is paid up on every one of those shares, and there is a third call now made on the fifth issue, which is due next month. In all probability—I do not say it is certain—we shall have to call up, for our present commitments, for contracts and extensions of works, in October and January next, the remaining two calls upon the fifth capital. We shall then have exhausted our powers as to those two issues, and I believe I am correct in saying that the amount derivable from those calls will be sufficient to cover all our present contracts for enlarging works, gasholders, &c., which we must provide for, in view of the very large increase in the consumption of gas which we are led to expect, and which must result from the increase in the population of London, and from the greatly increased area of our operations in the suburban districts. Gentlemen who have visited Kensington, and that portion of London, lately, must have observed the enormous extension of building that is taking place, in South Kensington particularly, also in the direction of Kensal Green. There is no doubt that, in the course of a few years, the whole of that ground will be covered with houses, and the Chartered Company will have to supply them with gas. It is, therefore, satisfactory to know that these two calls, when made, will most likely be sufficient for our present needs, without touching upon the capital we are entitled to raise under our Act of 1876—£1,000,000—and which, when issued, we shall be obliged to offer to the public by auction, though I dare say, when such is the case, you will be very glad to compete for it. However, we shall not have to touch that, I hope, for more than a year. We are about to ask power at this meeting, as stated in the notice convening it, to raise, by the creation and issue of debenture stock, the sum of £125,000, which we are entitled to do in consideration of the amount paid up on the fourth and fifth issues of preference shares. We have offered this stock to the Proprietors, in the first instance, at the rate of 4 per cent., and I am happy to say that, even up to the present moment, of the £125,000 which we propose to raise, upwards of £90,000 have been applied for, and I have no doubt we shall get applications for a great deal more than we require, even at this very low rate of interest. I advert to this as a subject matter of congratulation, for I was shown a letter the other day from a proprietor, complaining dreadfully of the stinginess of the Directors in not offering this stock at 5 per cent. interest instead of 4, thus putting a small bonus into the pockets of the Proprietors. The simple answer to that complaint is this—would you, in your own business, raise money at 5 per cent. when you could get it at 4 per cent.? This stock is debenture stock, irredeemable for ever, and by issuing it at 5 per cent., we should encumber this Company with an enormous annual outlay, whereas it is evident the Public and the Proprietors are most willing to take it at 4 per cent. I think the Proprietors will agree with the Board that the course we have adopted in raising the money at this low rate of interest is for the future benefit of the Company. I have just been told by the Secretary that the Proprietor, who made such grievous complaints against the Board for their stinginess, has written to-day apologizing for having done so. It has been suggested this morning by another Proprietor that we ought to encourage a new Company to undertake the manufacture of our tar and sulphate, in place of doing it ourselves. The Board have considered this question most attentively, and have decided unanimously against such a step. We shall be able to derive a considerable amount of profit by working the concern ourselves, and we intend to put that profit into the pockets of the Proprietors. And now, gentlemen, I will wind up my remarks in a few sentences in reference to our works at Beckton. I wish some of the Proprietors would go down there and see the works for themselves. It is a most interesting place now. At the present moment we are manufacturing our own lime; we work up our old iron; and by-and-by the tar and sulphate works will be in operation—I hope before Midsummer next. I say it is well worth a visit from the Proprietors. I only wish our Official Auditor would sanction our taking you all down; but he is too vigilant a man for that—too cautious. Still, if I had my own way, I should like to see you all there. On former occasions I think many of you have visited those works when they were in their infancy. We have hundreds

of people there from abroad during the year. I have had the pleasure of receiving there a great number of scientific men, who have gone to inspect the works, and to gather a wrinkle from witnessing our operations. I believe the Beckton and Bromley works, from their situations, are the most prosperous in the world; I do not think anything can compete with Beckton, and I may say that the management of all our works has met with the sincere commendation of the Court of Directors. I beg now to move—"That this meeting do agree with and confirm the report of the Directors, and the Auditors report and statements of the accounts of the Company, as transmitted."

Mr. E. VAUGHAN RICHARDS, Q.C. (the Deputy-Governor), seconded the motion.

Mr. S. WARD said the Governor had spoken about improvements which had taken place in electricity, and he should have been glad to hear that great improvements were taking place in the manufacture of gas. He sometimes heard complaints of the quality of the gas supplied, and some of his friends told him they were leaving off the use of gas. He would, therefore, urge upon the Board that, having secured 10 per cent. to the Shareholders, they should endeavour in every possible way to produce the best gas they could for their consumers. In the notice of meeting he thought it should have been stated which of the Auditors went out of office on this occasion.

The SECRETARY said there need be no misapprehension on that point, as the notice stated that "the whole of the Auditors will retire, and will offer themselves for re-election."

Sir THOMAS DAKIN: Gentlemen, as an old Director here, and one who has taken a very active part in the gas administration of the Metropolis, and particularly of the City of London, I attend to-day with pleasure to see my old friends, and to hear the very able speech of the Chairman. Having done so, I beg leave to express my gratitude to the Board for the efforts they have made for the good of this concern, and for the prosperous condition in which they have placed us. I cannot sympathize in the smallest degree in the remarks just made by the Proprietor behind me, and can only rejoice to think, with regard to them, that, having no important point to challenge, either in the report or in the Chairman's speech, he has been obliged to fall back upon a trivial technicality to furnish himself with a topic on which to address the meeting. There is one remark I wish to offer in reference to some observations by the Chairman, and it is this: Some years ago, when I had the honour to occupy a similar position in another company, a scheme was brought forward for establishing the "Electric Light and Colour Company," and I thought it my duty at that time to go and see for myself the nature of the operations which they were carrying on. I took with me two of the ablest chemists of that day—Professor Graham, afterwards Master of the Mint, and Dr. Leeson—to investigate the matter, and advise whether there was anything in it. We went most carefully into every question, and when we came back from our inspection, I recollect Professor Graham saying that gas companies had no reason to fear the competition of the electric light until its promoters could accomplish two objects—viz., the storeage of the light and its distribution. That has not yet been done, and, until it is accomplished, we have no reason to be anxious on that account. I have no doubt that for certain purposes, and in its own way, the electric light may prove to be exceedingly useful; for instance, in outside illumination of large spaces; but it is not at all adapted for the supply of such places as gas is applicable for, and I apprehend, therefore, that nothing which our Chairman saw in Paris, or we have seen in London, would give any serious foundation for the scare and alarm to which the investing public have been recently exposed. Before I sit down, I beg to express my regret that an analogous body to that to which I belong have behaved, as I think, rather harshly to this Company, when, as the Governor informs us, for a series of years the average quality of the gas supplied by this Company has been one candle above the parliamentary standard, and that only on this one particular occasion it fell below it. I think it would have been only just that the Metropolitan Board should regard that as the exception, proving the general rule that the supply of gas by the Company has been eminently successful, and not have seized upon the opportunity to exact a fine. That it was so regarded by the Magistrate who heard the case seems to be clear, for, though he found himself compelled by law to inflict the fine, he marked his sense of the harshness of the proceeding by refusing to give the Board their costs.

Mr. BURRAGE asked whether arrangements could be made by the Directors for the payment of dividends earlier, and whether, if they did not see their way to increase the rate of dividend, they could not arrange to pay the income-tax for the Proprietors.

Mr. SAYWELL objected to the large surplus carried forward, and, with reference to the reserve-fund, thought the Proprietors should be informed what the limit would be. As an old Shareholder in the Imperial Company, and having no interest in the 5 per cent. preference shares about to be converted into ordinary stock, he objected to any portion of the profits of the amalgamated Company being appropriated to pay the excess of dividend on this class of Chartered shares.

Mr. JACKSON asked for what purpose the £125,000 of debenture stock was to be issued.

Mr. BADDELEY: I have attended a great many public meetings, and heard a great many addresses from chairmen, but I am bound to say that I never listened to a more lucid speech in reference to the affairs of a company than that which has been made by the Governor on this occasion. As to Mr. Saywell's remarks, I can only say that I hold some of this 5 per cent. capital, and, as a holder of it, I am in the position of having lent my money at that rate of interest to the Company, to enable them to make a larger profit, and I am entitled, by the terms of issue of those shares, to the increased dividend when the time arrives. I am, therefore, only too pleased that the Directors have guaranteed it by setting aside a surplus on this occasion. The Proprietor who first addressed us recommended the Directors to supply a better quality of gas. I do not know why. We are under an Act of Parliament, and we are complying with every requirement of that Act. Surely there is no reason why we should give more than we are bound to give for the money we receive. As to the alleged discontinuance of the use of gas in drawing-rooms, to which my friend referred, I think if it is as he stated, it would be well for him to address his observations to the householders, and suggest that they should look to their interior arrangements, and not expect the Company to improve the quality of their gas because people will burn it through imperfect fittings. But my friend has omitted to allude to a very singular fact. Until the commencement of last year this Company were supplying gas at the rate of 3s. 9d. per 1000. A reduction of 3d. per 1000 was then made in the price, and that 3d., I believe, would represent, on the last six months consumption, a sum of about £60,000 taken off the rental. And it is remarkable that, notwithstanding this fact, our rental has increased to the extent of £212 over the corresponding period of the previous year. This does not look as if consumers were discontinuing the use of gas because it is not of a better quality; it rather shows the elasticity there is in the consumption. I may say, in conclusion, that I am glad to see every member of the Board present to-day, apparently in excellent health, and will express the hope that they may long live to preside over the affairs of this Company.

Mr. CRACE said the Governor, in referring to the electric light at Paris, did not make any allusion to its cost, nor did he say anything as to whether it had been tried under ground-glass shades, so as to qualify the intensity of the light, and diffuse it more.

The GOVERNOR: With regard to the question put by the last Proprietor, I may remark that the expense of the electric light is not yet ascertained. No one could tell me what the cost would be; but, certainly, from the appliances which are necessary in connection with it, the expense will be much greater than that of gas. In order to introduce it to dwelling-houses, a separate engine would be required for each house, and the cost of these engines would be considerable, although I believe that engines of comparatively small power would suffice. But if engines are to be introduced into houses, the question will be raised as to the future rates of fire insurance. The Insurance Companies might not be willing to continue the present rates for houses in which engines were in daily use. There is also a certain amount of danger from explosions; but I believe there is an invention coming out which may obviate that difficulty in some degree. With regard to a question put by an honourable Proprietor as to the way in which the £125,000 to be raised by debenture stock will be applied, the answer is that it will be applied to the general working of the Company. Instead of raising fresh share capital from the Proprietors, we raise the money we need by debenture stock, at a very much lower rate of interest—*i.e*, instead of raising it by 5 per cent. preference or 10 per cent. ordinary shares, we raise it at 4 per cent. and thus secure a greater profit for the general undertaking. As to the earlier payment of dividends, I think we can hardly do that. We do pay our dividends as soon as most companies. Before warrants for those dividends can be prepared, the dividends themselves have to be sanctioned and confirmed by the general meeting of Shareholders, and our Act of Parliament prescribes that the general meetings shall be held in the months of February and August. I have been asked about the income-tax. Well, if we paid that we should have to deduct it from the reserve-fund; we are not allowed to do otherwise. We may have a higher dividend by-and-by; but, as at present constituted by Act of Parliament, we are allowed to apply a certain amount of divisible profits to the augmentation of the reserve-fund. That fund now amounts to about £130,000, and to place the fund in a satisfactory position is the policy approved of by the general meeting of Proprietors held immediately after the amalgamations took place.

The motion for the adoption of the report was then put and carried.

A PROPRIETOR: There is one question which the Governor did not answer—viz., to what amount may the reserve-fund be raised?

The GOVERNOR: To any amount.

The SECRETARY brought up from the Court of Directors a minute recommending the dividends mentioned in the report, and on the motion of the GOVERNOR the said dividends were declared accordingly.

The retiring Directors, Messrs. Bennoch, Chubb, Evans, and Giffard, were re-elected, as were also the Auditors, Messrs. Barker, Chisholm, Briggs, and Farnan.

The GOVERNOR moved—"That the Directors be, and they are hereby authorized to raise, by the creation and issue of debenture stock, the further sum of £125,000 under the provisions of the Company's Act, 1872, at such periods, upon such terms, and under such conditions as the Directors shall determine."

The DEPUTY-GOVERNOR seconded the motion, which was agreed to.

The SECRETARY brought up a minute from the Court of Directors, under the provisions of section 58 of the Company's Act, 1868, declaring certain lands, &c., to be no longer required for the purposes of the Company, and asking the authority of the Proprietors for their sale. These properties were the lands, &c., belonging to the late Independent Gas Company at Kingsland, and the offices, &c., of the late Imperial Gas Company, John Street, Bedford Row.

The GOVERNOR moved a formal resolution for carrying out this object, which was agreed to.

Mr. PRICE: Before we separate, I beg to move a vote of thanks to the Governor and Board of Directors. The report which has been submitted to us, and the statements which the Governor has made as to the affairs of the Company, are most satisfactory, and show, I think, the great amount of attention which has been bestowed upon them by the Board.

Sir THOMAS DAKIN seconded the motion, which was cordially adopted.

The GOVERNOR: Gentlemen, on behalf of my colleagues and for myself, I beg to offer you my sincere thanks for the honour you have done us by the unanimous and cordial vote just passed. I can only assure you that in the future we shall devote our energies entirely to the interests of the Company, as we have done in the past.

The proceedings then terminated.

YORK UNITED GAS COMPANY.

The Half-Yearly Meeting was held on Thursday, Feb. 7—Alderman WEATHERLEY in the chair.

The SECRETARY (Mr. C. Sellers) read the Directors report, which was as follows:—

The balance of profit available for dividend falls short of the necessary amount by £955. This result your Directors, in a great measure, anticipated when they reduced the price of gas in July last from 3s. to 2s. 6d. per 1000 cubic feet, and intimated their intention to meet any deficiency which might arise by appropriating some of the accumulated surplus profits of previous years.

The business of the Company has been maintained in a healthy condition, although the consumption of gas, from the unusually mild weather and continued depression in trade, has been somewhat checked. The latter cause has also further reduced the value of residuals, which form a substantial item in the Company's revenue. Your Directors, however, are glad to be able to state that the public have now become fully alive to the great value of gas coke as a cheap domestic fuel.

During the half year your Directors, to meet the growing demands of the Nunnery Lane and Bishopthorpe Road districts, have relaid the main from Blossom Street to Bishopthorpe Road with one of increased capacity.

The resolution passed by the Shareholders at the last half-yearly meeting, authorizing the Directors to take the necessary steps for increasing the capital of the Company to meet further extensions, is now being carried out by a Bill which your Directors are applying for in the present session of Parliament, and which will be submitted to this meeting.

The Directors recommend that Mr. W. W. Morrell, Manager of the York City and County Banking Company, be appointed Treasurer to this Company for three years, in place of Mr. Francis Taylor, who has resigned that office.

Your Directors recommend that the usual dividend of 5s. per share be declared, the same to be paid on and after the 12th inst., free from income-tax.

The CHAIRMAN, in moving the adoption of the report, remarked that the result of the last half year's business was a little below what the Directors anticipated, but that arose entirely from the continued flatness of trade, and the necessity which almost everywhere existed for economizing expenses. Those reasons had not only checked that increase in the consumption of gas which usually follows a reduction in price, but they had further depressed the value of certain residual products, which helped to make up their revenue. Of course all that was not new, and one almost got weary of talking about the general depression of trade, and its effects upon every branch of industry. Gas Companies, therefore, could not hope to escape; but in their case, having adopted the good old rule of putting by something for a rainy day, they hoped to pull through until better times arrived. The Shareholders would be aware that it was the policy of the Company in prosperous times to put by the surplus profits

over and above the dividend, so as to meet exceptional circumstances like those at present existing. It was that policy of giving back the surplus profits to the gas consumers which had enabled the Company to supply gas at rates below those in most other places, and which now enabled them to charge the extraordinarily low price of 2s. 6d. per 1000 feet, a price that was found in scarcely half-a-dozen towns in the kingdom. He need scarcely say that the recent fluctuations in the value of different articles they bought, and articles they sold, had been closely watched. In the matter of iron the price was exceptionally low, and the Directors had taken advantage of that, and had relaid the main down Nunnery Lane with one of larger dimensions, and in similar districts where the city had recently grown they would have similar work to do. With regard to coke—one of their great items of revenue—he was glad to say that the efforts the Directors made to bring that article under public notice as a cheap fuel had been very successful. With respect to the application they were making to Parliament for power to raise new capital and to extend their works, he said that the necessity for this step was fully explained at the last half-yearly meeting, and therefore upon that point there was nothing further for him to say now. It must be evident to all that they could not carry on increased business without increased plant, and he could assure them that every step they had taken in that matter had had the fullest possible consideration. The Directors had no other motive than to conduct the business of the Company so as to be not only satisfactory to the Shareholders, but to the whole city, for they felt sure that a policy which would separate the interests of the Shareholders from the common interests of the city would be as unwise as it would be suicidal. There was only one more matter that he would allude to, and that was the appointment of a Treasurer, which, by their Act of Parliament, required the confirmation of the Shareholders. Mr. Francis Taylor, of the Union Bank, their late Treasurer, having resigned, they proposed that Mr. W. W. Morrell, Manager of the City and County Bank, should succeed him, and be appointed for three years. They proposed that change of bank upon the same principle that they applied to all their business in the city, and that was to change periodically from one tradesman to another. It was a principle which had worked in the most satisfactory way, and one which they felt sure the Shareholders would deem fair and just.

The LORD MAYOR seconded the motion for the adoption of the report, and said he had great gratification in doing so, believing, as he did, that the Directors had the full confidence not only of the Shareholders, but also, so far as he could judge, of the citizens at large. If any impartial man compared the charges made by this Company with those of any other Company for years past, he would be bound to come to the conclusion that this Company managed their business well.

Mr. W. W. HARGROVE congratulated the Directors on the successful result of another half year's working, and the city on the fact that there was no intention to increase the price of gas. This was due to the sagacity and forethought of the Directors in husbanding the surplus profits of more prosperous days to meet contingencies like the present, when the general depression of trade, affecting detrimentally every species of industry, had necessarily reduced the consumption of gas. The Chairman, in his remarks, had mentioned that there were not a half a dozen places where the gas was so low as in York. He (Mr. Hargrove) had carefully gone through the list of prices, and he found that there were only two towns—viz., Walsall and Plymouth, where the price was less than in York; and there were circumstances which fully accounted for it. At Walsall, where it was 2s. 5d., they had coal at their very door, and at Plymouth, where it was 2s. 4d., they obtained it from South Wales at an extraordinarily low rate. To the Bill, for which the Directors were applying to Parliament, it would be impolitic to refer in the present stage of negotiations between the Company and the Corporation, further than to state that he thought they might safely rely upon the good sense of those who had promoted the petition against the Bill. to avoid any factious opposition, and upon the just protection which Parliament always afforded to a Company who, like the one in question, were seeking powers of extension, not for their own aggrandisement, but for the advantage of the city. He was sure the Directors had the full confidence of the shareholders, and he believed of the inhabitants generally. Extending as York was in every direction, it was obvious that the Gas Company must be prepared to meet increased demands. He believed the public were perfectly satisfied with the present price of gas in York, that they felt they had been fairly dealt with in the past, and that they had could rely upon receiving the same generous treatment in the future.

The CHAIRMAN, in reply to inquiries by Mr. Feltoe, said the Directors had no intention to extend the mains to any village that would not return a proper dividend. The city was extending, and tradesmen were erecting villas outside, and it was necessary for the protection of life and property that there should be sufficient light near the houses. He was surprised at any one asking why they were going to enlarge their works. The reason was simply because they required additional storeage for gas, and additional carbonizing power. They did not want to borrow money if they had nothing to do with it, but they were going to increase their capital in order to provide for an enlargement of their works, of which they stood in need now. They were not going to increase their carbonizing powers at present, but only to enlarge their storeage. It would take three years to erect a gasholder, and by that time they would have to augment their carbonizing power. They were well aware that it was not necessary for the whole of the capital to be called up at once. Thirty years ago they commenced, with a capital of £75,000 and borrowing powers amounting to £25,000. The borrowed money had since then been capitalized, and the whole was now expended. But what had they done in the meantime. The works had been extended, and there was not now an inch of spare ground. He hoped the Shareholders would have confidence in the Directors to believe that they had no other intention than to do what was necessary for the proper carrying on of their business. In answer to further inquiries, he said the reason why the Directors inserted a clause in their Bill for extending the radius of the Company's operations was that they knew it was the intention of the Government to erect extensive military works at Strensall, and they thought it possible that the Company might be required to supply the gas. They were not going there for any other purpose, and if their gas was not required they would not extend their mains there. If they supplied the gas, it would tend to increase their profits.

Mr. FELTOE said they were proposing to raise £100,000 for the purpose of forming a new company, and a company which could not in any degree be associated with the present Company, but which would have the benefit of their mains and works. They could not increase the present financial position of the Shareholders one iota, and the money which they proposed to raise would not benefit them in any degree. If it was necessary for properly conducting their business to increase the storeage room, they did not require to cross the water for the purpose, as with a little management they could find sufficient room on their present premises.

Mr. RYMER, referring to the proposed change of bankers, said he could understand that it might be desirable that they should change their tradesmen and thus distribute favours, but he did not think that the same reason applied to their bankers.

The CHAIRMAN said the intention had not arisen from any fault they had to find with their present bankers, but because the Board thought it desirable to make a change every three years.

The motion for the adoption of the report was put and carried, and a resolution declaring the dividend recommended by the Directors was agreed to, as was also a further resolution appointing Mr. W. W. Morrell Treasurer of the Company.

The meeting was then made special, and a motion approving of the Company's Bill now before Parliament was adopted.

A vote of thanks to the Directors, which was acknowledged by the Chairman, terminated the proceedings.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The week has been fraught with so much political excitement that all sorts of business operations have been confined within very narrow limits. Producers have for the most part manifested an unwillingness to enter into forward contracts, in the belief that an outbreak of war might render certain classes of iron more valuable, whilst consumers have held aloof under the impression that the commencement of hostilities would inevitably be succeeded by a considerable depression of values of all descriptions. Probably both views are to a certain extent based on sound reasoning, but, be that as it may, it is not the less certain that the immediate result has been to further minimize the business of most branches of the coal and iron trades of this, as well as of other, districts. It seems, in fact, to be now more than ever certain that we cannot look for any real improvement in the iron trade until it is clearly seen in what manner the Eastern Question is to be disposed of. On the other hand, two or three branches of trade at Sheffield are already being benefited by the warlike preparations of this country—good orders having been received here for heavy ordnance steel tubes, as well as for rifle barrels.

During the week there has been no material alteration in local and district pig iron quotations, despite the somewhat firmer tone of the Scotch market. In merchant iron, also, prices remain on the previous very low basis, and none of the works are running more than half time. At the Midland Iron-Woks, near Rotherham, the ironworkers have agreed to a reduction of 7½ per cent., and at other large establishments a like step is being initiated.

The brassfoundries are not by any means busy, but some of them are doing a steady amount of business in gas, water, steam, and general plumbers fittings.

The coal market is not quite so firm, and during the week some of the coalowners and merchants have lowered their prices to the extent of 6d. per ton. At many of the pits the miners wages are being lowered, although at some few places the men are offering resistance. Steam coal is quiet at 5s. 6d. up to 9s. per ton at the pits.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

There is but a very limited demand for all descriptions of fuel in this district, and for common sorts if anything prices, are a trifle easier. For some, of the better classes of round coal there has been a tolerably good inquiry, but there has not been anything like the usual winter trade doing in this class of fuel, and the season when any active demand can be expected is now rapidly drawing to a close, whilst the requirements for gas-making purposes are also beginning to fall off considerably. For round coal the quotations at the pit mouth remain at about 10s. to 11s. per ton for best Wigan Arley, 8s. to 9s. for common Arley, 8s. to 8s. 6d. for Pemberton four-feet, and 6s. to 7s. for common Wigan mines. The demand for forge coal and engine classes of fuel is very dull, and there is a good deal of pushing for orders. Prices are irregular, but the average quotations at the pit mouth may be given at 5s. 6d. to 6s. 6d. per ton for steam and forge coal, 5s. to 5s. 6d. for good burgy, 4s. 6d. to 5s. for common ditto, and 3s. to 4s. for good slack; whilst common is offered almost at any price up to 3s. per ton.

The shipping trade continues extremely quiet, there being very few orders for any description of fuel offering in the market, and exceedingly low prices are quoted to secure business.

In the iron trade business is in a very unsatisfactory condition, and there is little or nothing moving beyond a few small orders for pressing requirements, which consumers are obliged to cover. Lancashire makers of pig iron are still doing very little, as they are unable to compete with the low figures at which outside brands are being offered in the district, and when the few contracts they have on hand are run out, it is not improbable that the present very limited production will have to be still further reduced. The finished iron trade is in no better position. None of the works in this district are busy, and in the majority of cases either only a portion of the plant is running, or the men have been put on short time. Prices are without change, and makers, so far, have been unable to agree to any uniform basis for quotations.

The finished iron makers have, however, been able to agree to another reduction in wages, and notices are being sent out to the men to the effect that their wages will have to be reduced 5 per cent.

The works of the Railway Steel and Plant Company, near Manchester, have been stopped, and about 400 men thrown out of employment.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

A good deal of change has taken place in the coal trade since our last report. The strike in the Northumberland steam coal trade is over, and the pits have resumed work. Odessa is now absolutely open to steamers. In consequence of these two circumstances coming together, shipments of coal have been much more active than a fortnight ago. In fact, there has been a considerable increase of exports at the Tyne Dock, mostly gas; and a considerable fleet of vessels are loading steam coal in the Northumberland Dock on the opposite side of the water. A fair amount of contracting was done last week by foreign Gas Companies, for the South of Europe and for Italy principally. One contract was for 60,000 tons of gas coals, to extend over the year, and others were for less quantities; 25,000 tons of gas coals were contracted for for Sweden. Several cargoes of gas coals were sent out to America last week by steamers. Some business was also transacted with France. The price, however, is unchanged. From 7s. to 8s. is about the quotation for best gas for immediate delivery. Shipping turns are from eight to ten colliery working days. Some sorts of second-class coal have been more in request. House coals, however, are very quiet. The mild weather is keeping back the demand for the better qualities of house coals.

The Baltic shipments of gas and steam coals are likely to commence shortly. Several contracts are reported to be closed for the season with Sweden, Germany, &c. The quantity of coke shipped during 1877 from the Tyne to Spain, for lead-smelting purposes, is about 105,000 tons, being an excess over the previous year.

The importation of Spanish lead during 1877 was about 31,000 tons, which was also an excess on the previous year.

The quotations for steamers to load coals to London are from 4s. 3d. to 4s. 6d., and there have been inquiries for steamers and sailing vessels to load coals to France. Several cargoes of gas coals have been shipped for Odessa; the rate is £12 per keel. There has not been much demand for small coasting vessels to load coals for the east coast, but small ships have been sought after for the Kentish and Channel ports, and there has been a good demand for small ships to load coals for the French by-ports. The outward freights for gas coals to America are unchanged. The American Gas Companies are procuring coals here at a marvellously low figure; 8s. is about the price for the very best sorts shipped, and the freights are from 5s. to 6s. 6d. per ton.

The iron trade is neither better nor worse; it goes on very quietly from week to week. With the rumours of war, and all the excitement that has prevailed for a fortnight, home business is about paralyzed. People have no idea what they should do, and Railway Companies and other carriers are feeling the uncertainty which surrounds business very much. Some fire-bricks and fire-clay goods were shipped last week, but the demand is not equal to an ordinary year, and all the business that has been done in shipments is, as a rule, in small quantities.

The labour market is not quite so much overstocked as it was a few weeks ago. Some hundreds of seamen have been got to sea, and a number of firemen, and such like persons employed on board steamers, have found employment.

Isle of Thanet Gas Company.—Mr. T. C. Fuller, who has for ten years represented this Company as Accountant and Secretary at both Ramsgate and Margate stations, and whose services were not retained by the Ramsgate Local Board at the recent transfer of the Ramsgate undertaking, is, we hear, still representing the Gas Company at their Margate station.

Gas Analysis.—The report of the Council of the Institute of Chemistry of Great Britain and Ireland, read at the first general meeting of the present session on the 1st inst., stated that Dr. Frankland, the President, has offered two prizes of £50 each, to be awarded by the Council of the Institute at the next general annual meeting, for the two best original investigations involving gas analysis, and conducted by Associates of the Institute.

Road Water Supply on the Meter System.—At the Meeting of the Wandsworth District Board on the 13th inst., Mr. Barber, the Surveyor for Streatham, presented the following report, which was referred to a Committee for consideration:—"In asking you to consider the arrangements for road-watering in the ensuing season, I beg to report that last year you watered 37 roads in the Parish of Streatham, the aggregate length being 13 miles 3 furlongs 168 yards. The whole of the water was purchased by meter of the Lambeth Water Company at 9d. per 1000 gallons low-level service, and 1s. per 1000 gallons high-level service. The total cost of water, including the hire of meters and stand-posts, amounted to £259 13s. 5d., or equal to £19 5s. 6d. per mile of road watered. The total expenditure for road-watering purposes last year was £870 8s. 2d. I would also desire to refer now, after 21 years experience in watering your roads, to the great saving effected by the meter system of purchasing the water, which last year alone was upwards of £450, and which fully justifies the calculations contained in the report which I made to the Board, when urging the adoption of this system in the year 1860. During the first eight years you paid for water and the hire of stand-posts £67 10s. per season of six months per mile of roads watered, irrespective of their width. During the next six years the charges for water and stand-posts were reduced to £53 10s. per mile per season. In the year 1870 I reported on the subject again, and in 1871 arrangements were made for having the water by meter, and these arrangements still continue. During the seven years just ended, the average cost of the water, including rent of meters and stand-posts, amounted to £22 13s. 3d. per mile of road watered per season of seven months, which is £30 16s. 9d. per mile per season less than the lowest charge paid under the mileage system."

Adoption of the Sales of Gas Acts at Leith.—Public advertisements have appeared, announcing that the Magistrates of the Burgh of Leith having considered the provisions of the Sales of Gas Acts, 1859 and 1860, and the Act of 1864, which enables certain Royal and Parliamentary Burghs in Scotland to avail themselves of the provisions of the first-named Acts, did, at a meeting held for the purpose on the 28th of December, 1877, resolve that the provisions of the said recited Acts shall be applicable to the whole District or Burgh subject to their jurisdiction on and after the 1st of April next. By these Acts it is provided that after the expiration of ten years from the date when the Acts shall come into operation within the Burgh of Leith, all meters whatsoever not previously stamped, which shall be used for buying and selling gas, or for the collecting of any rates or duties, or for making any charges on the passage, transmission, or conveyance of gas, shall be examined and tested under the authority of said Acts, and stamped if found correct; and it is also enacted that no meter, for the purpose of ascertaining the quantity of gas sold, shall be fixed for use after the expiration of twelve months after said date, when the Acts shall come into operation, unless the same shall have its measuring capacity denominated or marked on the outside thereof in legible letters or figures, and shall be stamped by the Inspector of Meters. And penalties are provided for non-compliance.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, and TWO MEDALS at the PHILADELPHIA EXHIBITION have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS;
Also 27 OTHER MEDALS AWARDED at all the GREAT INTERNATIONAL EXHIBITIONS.

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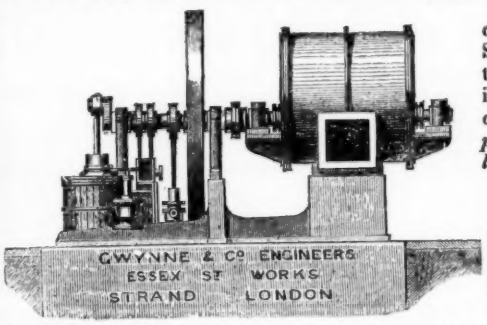
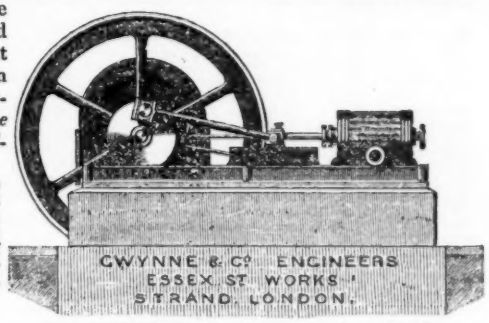


EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 7,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



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Exhausters, with or without Engines combined, can be made to pass the gas without oscillation or variation in pressure.
Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers,
ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

Gwynne & Co.'s New Catalogue on Gas-Exhausting and other Machinery may be obtained on application at the above Address.

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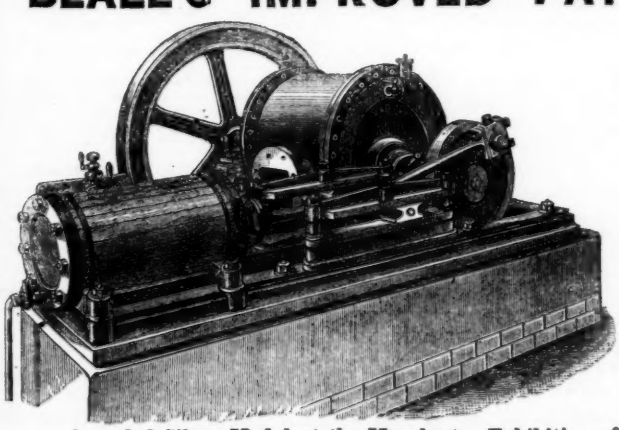

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TAR, LIQUOR, AND OTHER PUMPS,
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CONDENSERS, BOILERS, &c.

Awarded Silver Medal at the Manchester Exhibition of the Society for the Promotion of Scientific Industry.

Phœnix Engineering Works:
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WANTED, Readers of the Pamphlet, "Cooking and Heating by Gas; on Burners," &c. Copies, by post, Threepence, direct from the Author, MAGNUS OHREN, Gas-Works, SYDENHAM, S.E.

WANTED, Two Second-hand Purifiers, 10 to 12 ft. square, with Connections. In good order.
State price and particulars to W. SMITH, Gas-Works, Newton, AYR.

DEVONPORT WATER-WORKS.

WANTED, several experienced Men as INSPECTORS of Water-Works Fittings.
Apply, stating age, experience, &c., to H. FRANCIS, Manager, Water-Works Offices, DEVONPORT.

WANTED, by a practical Man, a situation as FOREMAN or WORKING MANAGER of Gas-Works. Good experience in erecting and management in all branches. Can be well recommended.
Address A. B., 8, Water Street, Pembroke Dock, SOUTH WALES.

WANTED, Orders for Samples to test the superior Silkstone, Wigan, and other Gas Coals and Cannel on Sale by G. J. EVESON, Gas Coal and Cannel Contractor, BIRMINGHAM.
N.B.—Prices on personal application, or by post or telegram, on shortest notice, and prompt delivery.

WANTED, by the Advertiser, Assoc. Inst. C.E., and thoroughly qualified as a Gas Manager, an APPOINTMENT at home or abroad. Speaks French, Spanish, Italian, and Portuguese, and has excellent testimonials.
Address No. 437, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a Gas Company on the South Coast, Two good, sober Men as STOKERS. Must be used to charging with the shovel. Constant employment at good wages.
Apply, by letter only, with testimonials or reference, to No. 438, care of Mr. King, 11, Bolt Court, Fleet Street, LONDON, E.C.

TO GAS-METER MAKERS.

WANTED, by the Cork Gas Consumers Company, a thoroughly competent Man to take charge of repairs of Gas-Meters, and, if required, to instruct Young Hands in the Shop. Number of Meters between 4000 and 5000.
Applications, stating wages required, and accompanied by copies of testimonials, to be addressed to DENNY LANE, Secretary, 72, South Mall, CORK.

WANTED, by Samuel Thompson & Co., Colliery Office, Lancaster, APPLICATION for PRICES from Gas Managers who are prepared to receive Tenders for GAS COAL or CANNEL.
John Leigh, Esq., M.R.C.S., F.C.S., &c., &c., in his analytical report of S. T. & Co.'s Coal, says: "It is remarkable for its purity, I have scarcely ever examined a Coal containing so small a quantity of ash, and when Cannel of the best description is scarce, it may well replace this material."

WORKING Gas-fitter and Plumbers BRASSFOUNDER Wanted, to manage a small Business at Smethwick, near Birmingham. £200 security required.
Address, Messrs. W. BLEWS AND SON, BIRMINGHAM.

ON SALE—One Station-Meter, to pass 1000 cubic feet per hour. Almost new. Will be sold cheap.
Apply to J. HALL, Gas-Works, St. Helen's, LANCS.

FOR SALE—A First-Class Station- METER, to pass 20,000 cubic feet per hour. May be seen at work. It is to be disposed of to make room for one of greater capacity.
Apply to E. GODDARD, Gas-Works, IPSWICH.

FOR SALE—Two Purifiers, 6 ft. by 4 ft. each, with Valves, and a quantity of 4-in. Piping, Bends, &c.
For price, apply to C. R. ADAMS, Auctioneer and Manager of Gas-Works, KENILWORTH.

FOR SALE—Four Purifiers, 9 ft. by 6 ft., with Centre-Valve, 6-in. Connections. Also Four Tiers of Wood Sieves, all in good working order, the removal of which is required for extensions.
Apply to Mr. EDWARD LISTER, Gas-Works, Yeadon, near LEEDS.

FOR SALE—One 4-inch Valve of B. Donkin's.
Four 7-in. VALVES of B. Donkin's.
One 8-in. VALVE of B. Donkin's.
Two 7-in. VALVES of another manufacturer.
All in good condition. Will be sold cheap.
Apply to Gothenburg Gas-Works, SWEDEN.

GAS PLANT FOR SALE.

TWO Purifiers, each 8 ft. square, with 8-in. Valves for working same. Also One Wrought-iron TRAVELLER, for lifting 12-ft. square Purifier Covers, with propelling motion attached. In good condition.
Applications to be made to the undersigned,
CHARLES READ, Secretary and Manager.

FOR SALE—A Telescopic Gasholder, 25 ft. by 10 ft. 6 in., in Brick Tank. Inner Lift new two years since, with new Guide Columns, Wheels and Carriages, Chains and Balance-Weights.
Must be removed for the enlargement of Works. To be sold a bargain.
For particulars, and order to view, apply to RICHARD HOLMES, Esq., Secretary, Gas Company, Arundel, SUSSEX.

FOR SALE—Two 50-ft. Gasholders and Columns, &c.
One 52-ft. Wrought-iron TANK (above ground).
One STATION-METER, to pass 15,000 cubic feet per hour.
Twenty 15-in. Circular MOUTHPIECES.
Seventy feet of 14-in. HYDRAULIC MAIN, D-shaped.
The whole of the above are in good condition.
Apply to J. S. REEVES, Manager, Gas-Works, BILSTON.

TO BE SOLD, very cheap, as they stand, for immediate removal, Four Cast-iron PURIFIERS, 10 ft. by 5 ft., with strong Wrought-iron Covers, Wood Sieves, and Lifting Apparatus complete, and 8-in. Hydraulic Centre-Valve and Connections.
Also a STATION-METER, in Cast-iron Case, with Clock and Tell-tale, and Bye-pass Valves, all complete. To pass 6000 cubic feet of gas per hour.
The above apparatus has just been thrown out of use at the Uxbridge Gas-Works, where it may be seen.
Apply, for price, &c., to Mr. ALFRED PENNY, 20, Abingdon Street, WESTMINSTER, S.W.

THE Directors of the Hebden Bridge Gas Company have for SALE the following PLANT:
Four Purifiers, 8 ft. by 6 ft. by 3 ft., with Lifting Apparatus.
Hydraulic Centre-Valve, with 10-in. Connections.
One 8-in. Vertical Condenser, consisting of 16 Pipes, with Bridge Pipes.
One 7-in. Vertical Condenser, consisting of 7 Pipes, with Bridge Pipes.
One Cast-iron Scrubber, 12 ft. by 3 ft. 4 in. by 4 ft. 4 in.
One Station-Meter, with 7-in. Connections, Valves, and Bye-pass complete.
Particulars may be had from the undersigned,
JOHN U. BLACKBURN, Manager.
Gas-Works, Hebden Bridge, Feb. 6, 1878.

TO MANUFACTURERS OF FIRE-CLAY RETORTS AND OTHERS.

THE Directors of the Longton Gas Com- pany invite TENDERS for the supply of 840 ft. run of RETORTS. Also Bricks and Clay.
A specification and form of tender may be had by applying to the Company's Manager, Mr. J. M. DARWIN, Gas-Works, Longton, STAFFORDSHIRE.
The tenders must be sent so as to be received on Monday, the 4th day of March next, and the Directors will not be bound to accept the lowest or any tender.

CONTRACT FOR GASHOLDER.

THE Police Commissioners of Inverness desire TENDERS for the construction of a Cast-iron TANK, of 71 ft. 6 in. diameter, and Telescopic GASHOLDER, in Two Lifts, each of 20 ft. depth, in terms of plan and specification, copies of which can be had on application to Mr. J. THOMSON, Manager of the Gas-Works, INVERNESS, on payment of One Guinea; and sealed tenders to be lodged with ALEXANDER DALLAS, Esq., Solicitor, Clerk to the Commissioners, on or before the 4th of March next.

PORTRUSH GAS COMPANY, LIMITED, CO. ANTRIM, IRELAND.

THE Directors of above Company invite TENDERS for One GASHOLDER and Cast-iron TANK. Also Hydraulic Main,
Specifications will be furnished by Mr. JOHN BAMFORD, Secretary, PORTRUSH.
Sealed tenders to be forwarded on or before the 25th of March next, addressed to the Chairman of the Portrush Gas Company.
The Directors do not bind themselves to accept the lowest or any tender.
Portrush, Feb. 8, 1878.

LYTHAM IMPROVEMENT COMMISSIONERS.

THE Gas-Works Committee are prepared to receive Designs and Tenders for supplying and erecting, at their Works, Lytham, Four 10-ft. square PURIFIERS, together with 10-in. Valve, and necessary Connections.
Sealed tenders, accompanied by designs, must be sent in to John Richardson, Esq., Chairman of the Gas Committee, on or before Tuesday, the 26th day of February, 1878.
Any further information may be obtained at my Office, Market Hall, Lytham.
By order of the Commissioners,
THOMAS BOWER, Manager.
Gas-Works, Lytham, Feb. 8, 1878.

BOROUGH OF BURY.

THE Gas Committee of the Corporation are prepared to receive Drawings, Specifications, and Tenders, for a CONDENSER of the Vertical Annular type, with 20-in. diameter, Connections, Pipes, Valves, &c., fixed complete. Minimum capacity, 70,000 cubic feet per hour.
Particulars may be obtained from J. Cartwright, C.E., the Borough Surveyor.
Tenders to be sent in, addressed to the Chairman of the Committee, on or before the 12th day of March.
By order,
F. BULL, Town Clerk.
Corporation Offices, Bury, Feb. 6, 1878.

THE LONDON GASLIGHT COMPANY. NOTICE is hereby given that the above Company will from Midsummer, 1878, next supply Ordinary Gas only; and that the supply of Cannel Gas will be discontinued from that date.
Dated this 13th day of February, 1878.
By order of the Board,
A. J. DOVE, Secretary.

THE Directors of the Wareham Coal Gas Company are prepared to receive TENDERS for the supply of from 280 to 320 Tons of Pelaw Main Gas Coals (best quality), to be delivered, free of charge, into lighters, at Russell Quay. The first delivery to be made not later than the 30th of June next, the remainder to be delivered by the 1st of September next.
Payment for the same will be made four months after delivery.
Tenders to be sent in to the undersigned on or before the 13th of March next.
By order,
F. FILLITER, Secretary.
Wareham, Dorset, Feb. 13, 1878.

THE Exeter Gaslight and Coke Company are prepared to receive TENDERS for the erection of a Telescopic GASHOLDER, about 115 ft. diameter, in Two Lifts, each about 25 ft. deep. Also for an Iron TANK, with all necessary excavations to receive same.
Plans and specifications may be seen on application to the Engineer, at the Basin Gas-Works, between the hours of Nine and One o'clock.
Separate and sealed tenders, marked "Tender for Gasholder," and "Tender for Tank," to be sent to me, the undersigned, on or before Saturday, Feb. 23.
The Directors do not bind themselves to accept the lowest or any tender.
By order,
W. A. PADFIELD, Secretary.
Gaslight Offices, Exe Island, Exeter,
Feb. 7, 1878.

MANCHESTER CORPORATION GAS-WORKS.

TO COLLIERY PROPRIETORS & OTHERS.

THE Gas Committee will receive, on the 25th day of March next, TENDERS of CANNEL and COAL, for delivery at their Works, situated at Gaythorn and Rochdale Road, over a period of One or more years, from the 30th day of June next (tenders for Three or Five years will have the preference), and the Committee are now prepared to receive applications for permission to send in samples.
Sealed tenders, stating price and quantity proposed to be delivered at each Station, the rate and period of delivery, and endorsed "Tender for Cannel" or "Coal," as the case may be, must be addressed to the Chairman of the Gas Committee, and delivered at this Office on or before Monday, the 25th day of March next.
The Committee do not bind themselves to accept the lowest or any tender.
By order,
JOSEPH HERON, Town Clerk.
Department, Town Hall, Jan. 30, 1878.

TO TAR DISTILLERS, MANUFACTURERS, AND OTHERS.

THE Directors of the Phœnix Gaslight and Coke Company are prepared to receive TENDERS for the purchase of the TAR made at their respective stations, at Vauxhall, Bankside, and Greenwich, for the period of One, Two, or Three years, from the 1st day of April ensuing.
The quantities will be approximately—Vauxhall, 1,200,000 gallons; Bankside, 290,000 gallons; and Greenwich, 400,000 gallons, in twelve months; total, 1,890,000 gallons.
Tenders may be made for one, two, or more of the stations.
Forms of tender and conditions of contract may be had upon application to the Secretary, 70, Bankside.
Tenders, endorsed "Tender for Tar," to be delivered at this Office on or before Wednesday, the 6th of March, at One o'clock p.m.
The Board do not bind themselves to accept the highest or any tender.
By order of the Court of Directors,
I. A. CROOKENDEN, Secretary.
70, Bankside, S.E., Feb. 18, 1878.

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EXPERIMENTAL RESEARCHES in PURE, APPLIED, and PHYSICAL CHEMISTRY. By E. FRANKLAND, Ph.D. (Marburg), D.C.L., F.R.S., Professor of Chemistry in the Royal School of Mines, &c. The work includes investigations on the Manufacture and Illuminating Power of Gas, on the Water Supply of Towns, and the Purification of Drainage from Towns and Manufactories.
"The memoirs now collected form a good example of the benefits which always accrue when science is adequately applied to technical subjects."—*Philosophical Magazine*, Feb., 1878.
J. VAN VOORST, 1, PATERNOSTER ROW.

TO GAS ENGINEERS, MANAGERS, &c.

HILL and CO., Gas Engineers and Architects, 11, Appach Road, BRIXTON RISE, S.W., prepare Designs for the construction of New Gas-Works, Bridges, and Roofs, or for the remodelling and extension of existing Works. Also provide Drawings of all kinds of Gas Apparatus and Plant. Drawings, Tracings, and Specifications copied for Engineers and Contractors.

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D. BRUCE PEEBLES & CO.

Beg to call the attention of Gas Engineers to the fact that the novel and original feature in connection with PEEBLES' SYSTEM OF CONTROLLING THE ACTION OF GAS GOVERNORS is the loading or acting on the Bell by Pneumatic Pressure instead of Weights.

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ANALYSES OF SCOTCH COALS, CANNEL, SPLINT, SHALE, &c., USED in the MANUFACTURE of GAS. By WILLIAM WALLACE, Ph. D., F.R.S.E., F.C.S., &c., Public Analyst and Gas Examiner for the City of Glasgow.

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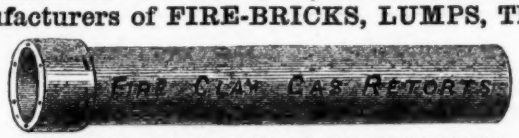

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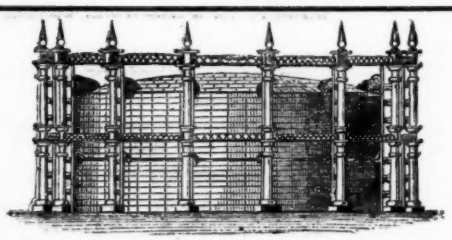

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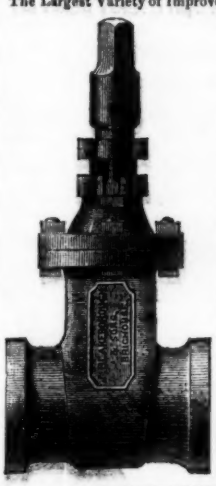

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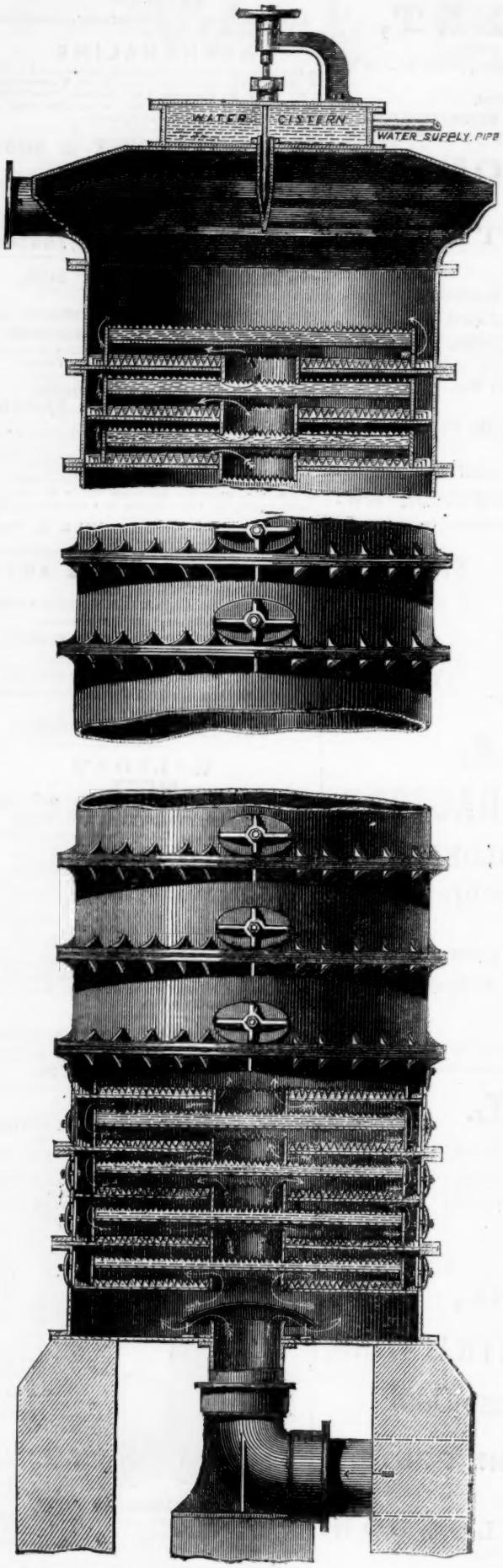

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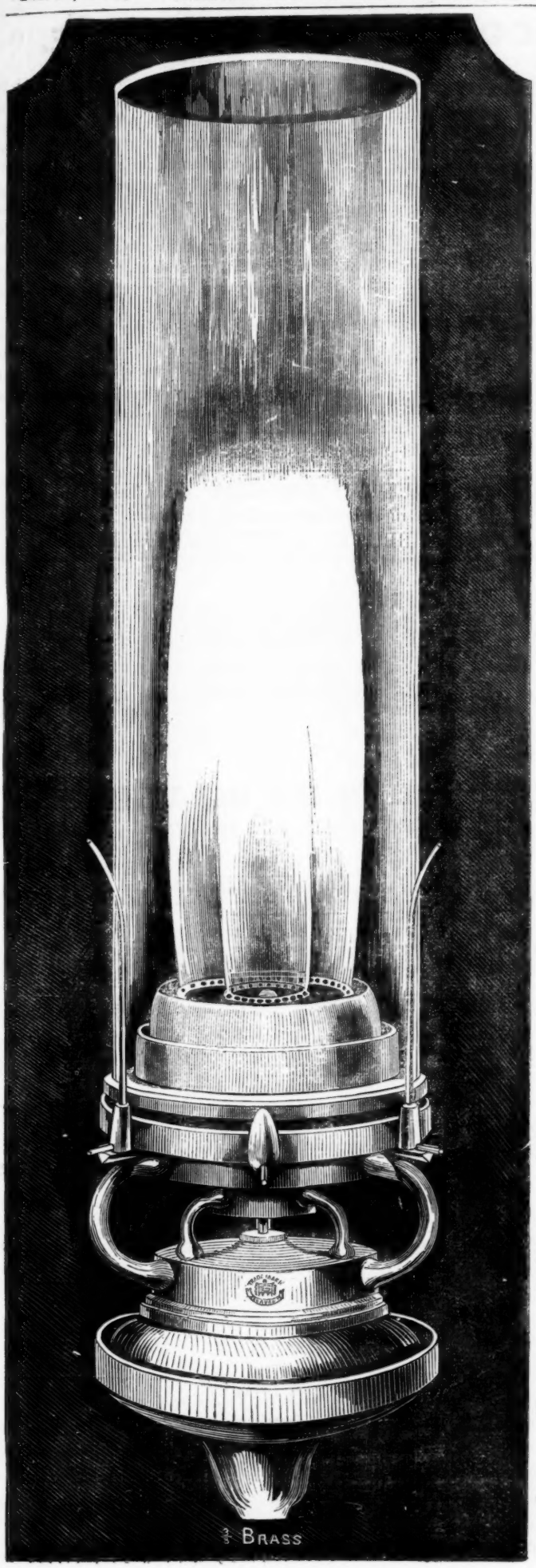

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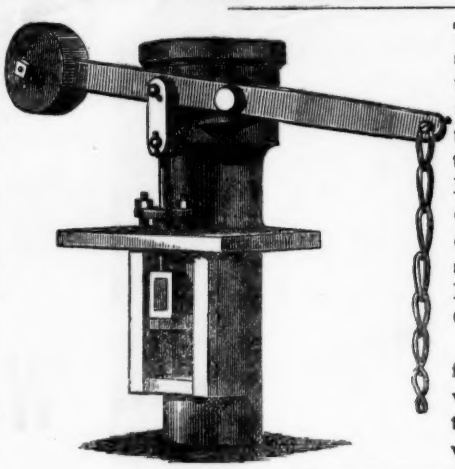

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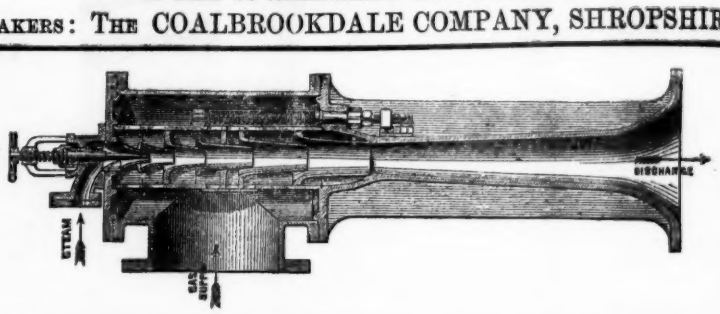

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Important to Gas Companies and Large Consumers of Paint.

SILICATE PAINTS are now used by the Principal Governments, many of the Gas, Railway, Shipping, and Manufacturing Companies throughout the world. These Goods possess the following great advantages over ordinary Paints:—

Unaffected by Sulphuretted Hydrogen Gas.
Better Colour and Greater Durability.
Non-Poisonous—almost inodorous.
Nearly 50 per cent. Cheaper; 1 cwt. having nearly equal Covering Power of 2 cwt. of Common Paint.
Withstand extremes of Heat that destroy Ordinary Paint.
Practically Indestructible.
No Chemical Action on Metals.
Prevent and arrest Corrosion of Iron.
Do not Soften by Immersion.

SILICATE ENAMEL PAINT is sold ready for use. One coat equal to two of ordinary Paint, and two of varnish. Dries hard, with a beautiful glossy surface, rendering varnish unnecessary. Shields iron from corrosion. No chemical action on metals. Suitable for iron or wood work. May be applied over Tar.

GAS COMPANIES and other **Large Consumers**, who heretofore have used ordinary Paints, are advised to give the Silicate manufactures a trial. By doing so they would find that their annual expenditure for Paint and labour very much reduced, and better quality secured. The use of Silicate Paints reduces the outlay for labour by at least one-half, as fewer coats are necessary, and the work done lasts double the time.

Price Lists, Pattern Cards, and other Information on application to the Sole Manufacturers,

THE SILICATE PAINT COMPANY,

LIVERPOOL: 30 AND 32, SEEL STREET. LONDON: 107, CANNON STREET.

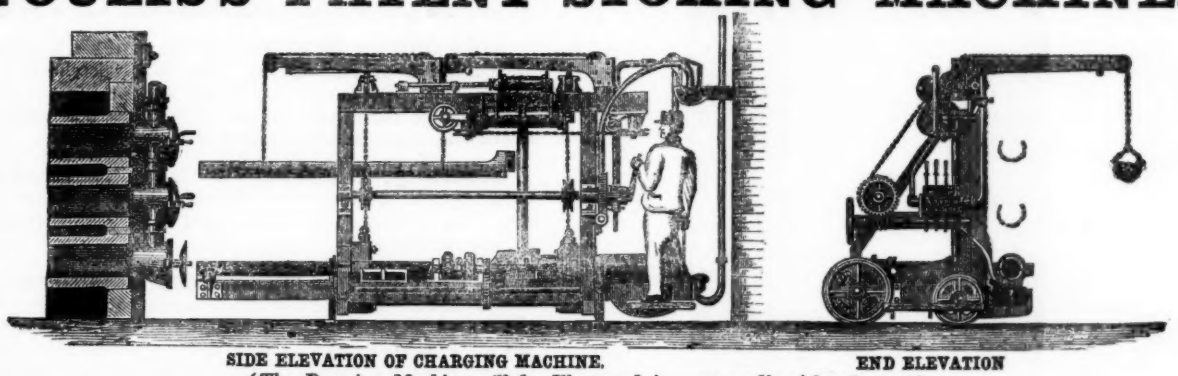
LIVESEY'S PATENT WASHER.

This apparatus effects the most intimate contact between the liquor with which it is supplied and the gas passing through it, resulting in the complete removal of all particles of tar, increasing the ammonia strength of the scrubber and condenser liquor, and removing a large proportion of other impurities—notably, carbonic acid. The Washer is intended to work in conjunction with a scrubber. It occupies little space, and is inexpensive. It has been in successful constant use for nearly three years, does not become clogged with tar or corroded by the action of the liquor or gases, it gives three inches of pressure, and only needs a supply of liquor to keep it in regular action without any further attention.

For Particulars and Prices apply to

Messrs. DEMPSTER AND SONS, ELLAND, HALIFAX, for the North;
Messrs. BAILEY, PEGG, AND CO., Bankside, LONDON, S.E., for the South;
Messrs. WILLEY AND CO., Commercial Road, EXETER, for West of England and South Wales;
Or to the PATENTEE, 589, OLD KENT ROAD, LONDON, S.E.

FOULIS'S PATENT STOKING MACHINE.



SIDE ELEVATION OF CHARGING MACHINE. END ELEVATION

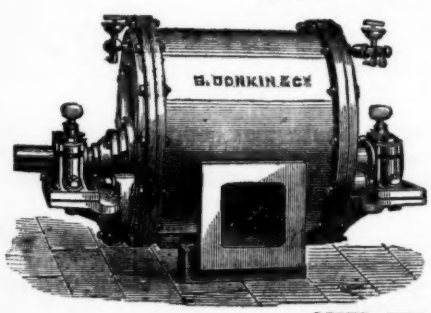
(The Drawing Machine will be Illustrated in next week's Advertisement.)

Makers: TANGYE BROTHERS and HOLMAN, London and Birmingham; ADAM WOODWARD and SON, Manchester; ROBERT LAIDLAW and SON, Glasgow; MASCHINENBAU-ACTIEN-GESELLSCHAFT HUMBOLDT, Kalk bei Deutz;
Or all particulars may be had from JAMES WOTHERSPOON, 31, St. Vincent Place, Glasgow.

J. BEALE'S NEW PATENT GAS EXHAUSTERS

MANUFACTURED SOLELY BY

B. DONKIN & Co.



These Exhausters have but one solid slide, which ensures less wear and friction, and thus fewer repairs are necessary. They are made with two outside bearings and with all latest improvements.

MESSRS. B. D. & Co. ALSO MAKE

STEAM-ENGINES FOR DRIVING GAS EXHAUSTERS.
IMPROVED GAS-VALVES.
VALVES FOR AMMONIACAL LIQUOR, TAR, and HYDRAULIC MAINS.
VALVES FOR SPECIAL PURPOSES, WITH COLUMNS, SCALES, AND GAUGES.
STEAM, GAS THROTTLE, AND BYE-PASS VALVES.
SCREW WATER-VALVES, &c.

LISTS, PRICES, AND INFORMATION ON APPLICATION.

WORKS: 55a, BLUE ANCHOR ROAD, BERMONDSEY, LONDON, S.E.

C. & W. WALKER,
8, FINSBURY CIRCUS,
LONDON, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

Fifty million cubic feet of gas per 24 hours are purified from ammonia by these Patent Scrubbers in a winter's day in the gas-works of London, where the purity of gas supply is the highest in the world, under the chemical restrictions of the Board of Trade.

Generally, wherever a high standard of purification is maintained in the chief cities and towns of the British Provinces and of Europe, these Scrubbers have become established.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

LESMAHAGOW CANNEL COAL.

FERRAND DAVIES,
148, GRESHAM HOUSE, OLD BROAD STREET, LONDON, E.C.,
SOLE AGENT FOR
THOMAS BARR'S LESMAHAGOW MAIN CANNEL.

Quotation and Analysis forwarded on application.

E. & W. H. HALEY,

General Ironfounders and Makers
OF
CAST-IRON GAS AND WATER PIPES.
Sizes 1¼ to 15 inches.

LISTER HILLS FOUNDRY, BRADFORD, YORKSHIRE.

GAS PURIFICATION.

BAILES & HALLSWORTH,
CONTRACTORS FOR THE
PURIFICATION OF COAL GAS
BY THEIR
PATENT HYDRATED PEROXIDE OF IRON MATERIAL.

The Material is adapted specially for taking up sulphuretted hydrogen, and will simultaneously absorb any ammonia that may pass the scrubbers.

The spent oxide resulting from our Material is more valuable than that from natural oxide of iron, and manufacturing chemists buy it in preference.

The Material has now been in use during the past three years in most of the principal Gas-Works in Yorkshire and elsewhere.

It contains considerably less moisture than natural oxide of iron, and is much cheaper and more efficient as a purifying agent.

B. & H. are purchasers of Spent Oxide, or will take Spent in exchange for New Material.

FOR SAMPLES AND TERMS, ADDRESS—
BAILES & HALLSWORTH, COPPERAS WORKS, ARMLEY. LEEDS.

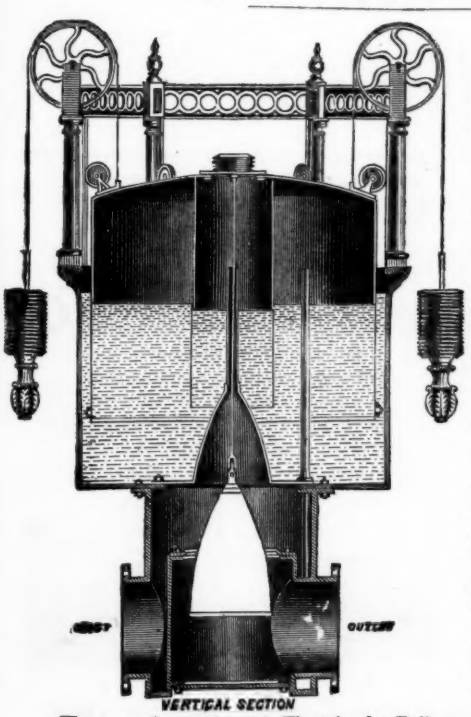
J. & J. BRADDOCK,

GLOBE METER-WORKS,
OLDHAM

Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



VERTICAL SECTION

The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

ROBERT MARSHALL,

CANNEL COAL MERCHANT,
173, ST. VINCENT STREET, GLASGOW.

SHOTT'S BOGHEAD.

LOTHIAN'S CANNEL

Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

MUIRKIRK, No. 1, CANNEL

Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.
Prices and full Analyses on application.

GAS COAL.

POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over 10,000 cubic feet of gas, with an illuminating power of 16 candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, LIMITED, West Riding and Silkstone Collieries, near LEEDS.

SCOTCH CANNEL COALS.

The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.

JAMES M'KELVIE,
CANNEL COAL MERCHANT,
HAYMARKET, EDINBURGH.
Established 1840.

HEBBURN MAIN GAS COALS.

T. Stone, Esq., of Weymouth, writes on Nov. 17, 1876: "I have used about 12,000 tons of this Coal, with, I think, the best possible results, although not always under the most favourable circumstances. My Coal account made up to Midsummer last showed a makeage of 10,594 cubic feet per ton of 14¼-candle gas, and not a hundredweight of Cannel used. This statement would, I know, be incredible to many men, and may provoke the remark, 'How much of it is paid for?' For the gratification of such, I have to say that, of the above quantity, 9866 cubic feet per ton of Coal carbonized were brought to charge and duly paid for, with the exception of about 6s. per cent. for bad debts. The coke is of excellent quality. The above facts I hold to be a greater recommendation to your Coal than any words of mine could be."

PRICES ON APPLICATION, EITHER F.O.B. OR BY RAIL IN TRUCK LOADS.

THE TYNE COAL COMPANY, LIMITED, OWNERS.
W. RICHARDSON, Fitter,
29, QUAYSIDE, NEWCASTLE-ON-TYNE.

ADDISON POTTER,

WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of
CLAY RETORTS, FIRE-BRICKS, AND EVERY DESCRIPTION OF FIRE-CLAY GOODS

CLOTH GAS-BAGS FOR MAINS.

As supplied to the Imperial, Chartered, and other London and Provincial Gas Companies. Bellows and Valves for inflating Well Dresses, Stokers Gloves, India-Rubber Suction and Delivery Hose, Gas-Tubing, Leather, India-Rubber, and Gutta-Percha Machine-Bands, Sheet and Washers, and Steam Joints.

T. BUGDEN, Manufacturer,
107, GOSWELL ROAD, LONDON, E.C.

GRIRDROD'S PATENT PORTABLE PIPE SCREWING MACHINE,

For 1 in., 1¼ in., 1½ in., and 2 in. Gas Threads, complete £7 10s.

In use at the chief gas-works, and giving great satisfaction.

For other useful goods, see Bailey's "Illustrated Inventions," post free 3s. 6d.; gratis to ledger customers.

W. H. BAILEY & CO.,
Brassfounders, Gauge Injector and Tool Makers,
ALBION WORKS, SALFORD,
LANCASHIRE.

WELLS, BIRCH, RYDE, and CO., Limited,

HOYLAND SILKSTONE COLLIERIES,

Near BARNSLEY.

This Company is now in a position to raise **2000 tons per day of REAL OLD SILKSTONE GAS COAL.**

"The quality of this Coal for **Gas** purposes, if equalled, is not excelled by any on record, and the Coke competes successfully with best Durham."—See *Mining Journal*, **Aug. 11, 1877.**

Prices quoted to any Railway Station, or F.O.B. Hull, Grimsby, Goole, Keadby, Liverpool, and Fleetwood.

Full particulars will be sent on application to above address.

THE

STANDARD WASHER AND SCRUBBER.

[KIRKHAM, HULETT, AND CHANDLER'S PATENT.]

Some of the advantages claimed for this Apparatus are as follow:—

The Exposing of a large Amount of Effectually-wetted Surface (which is continually reproduced) to act upon the Gas.
Unerring Regularity in the Distribution of the Liquor.
Saving of Expense in Providing and Exchanging Scrubbing Material—none being required.
Economy of Space, thus enabling the Apparatus to be protected from the Weather.
Economy of First Cost and of Maintenance.
It works without Pressure.
It is particularly adapted for Gas-Works where Sulphate of Ammonia is manufactured.

Applications for Prices, &c., to be made to

Messrs. KIRKHAM & HERSEY, GAS ENGINEERS, 21, ABINGDON STREET, WESTMINSTER.

IMPROVED
COMPENSATING GAS-METER.
HUNT'S PATENT.

This Meter supplies a want long felt, by putting an end to the loss sustained by Gas Companies through the overworking of their Meters.

EXTRACTS FROM REPORTS.

"I am able to report that the Meters have given in each test most satisfactory results."—*Mr. H. Sporne, City of London Meter Inspector.*
"I consider the arrangement is a great improvement upon the Meters in present general use."—*Mr. T. Jackson, Meter Inspector, Birmingham.*
"I would observe from the results of my testings that the Meters are a great improvement on the ordinary Wet Meters in general use."—*Mr. H. Airey, Meter Inspector to the Metropolitan Board of Works.*

COPIES OF REPORTS SENT ON APPLICATION.

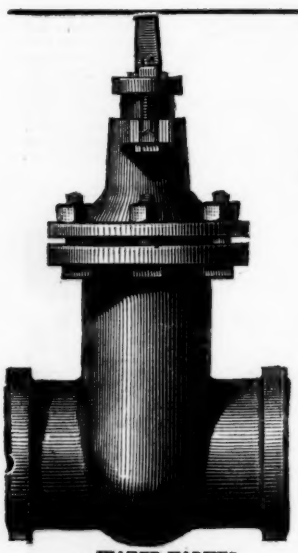
MANUFACTURED BY

JOHN BENT & SON,

WET AND DRY GAS-METER AND GAS APPARATUS MANUFACTURERS,

BELL BARN ROAD, BIRMINGHAM.

Established 1830.



WATER-VALVES.
All Sizes, Flange and Socket, kept in Stock, tested to 1000 feethead.

SIMPSON & COMPANY,

ENGINE-WORKS,

GROSVENOR ROAD, PIMLICO,

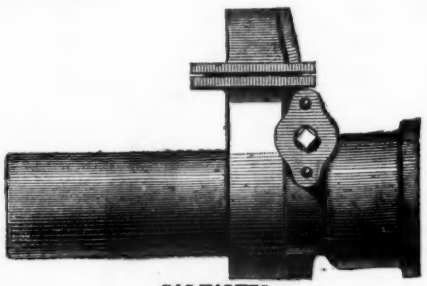
LONDON.

SCREW-COCKS, HYDRANTS,

SLUICES, PENSTOCKS,

And all other Machinery for

WORKS OF WATER SUPPLY, DRAINAGE AND IRRIGATION.



GAS-VALVES.
All Sizes, Flange and Socket, kept in Stock, tested to 100 feet head.

THE SILKSTONE & DODWORTH COAL & IRON COMPANY, LIMITED,

DODWORTH, BARNSLEY.

BENJAMIN WHITWORTH, Esq., M.P. . . . . Chairman.
Mr. RICHARD HARTLEY . . . . . Managing Director.

REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON, Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—

"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces **12,240** cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

HYDRATED PURIFYING MATERIAL.

Samples on application.

MESSRS. SPENCE BROS., LIMITED,

Will be glad to supply the above on the most favourable terms.

PRICES ON APPLICATION.

ALSO PATENT DRY COPPERAS FOR EXTRACTING AMMONIA.

VICTORIA CHEMICAL WORKS, BRADFORD, NEAR MANCHESTER.

Established

1795.

JOSEPH CLIFF & SONS,

THE ORIGINAL

WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

London Wharf: No. 4, inside Great Northern Goods Station, King's Cross, N.;

LIVERPOOL: Back Leeds Street.

SPECIAL NOTICE.—Our Patent Machine-made Retorts have now been in *actual work* nearly 1000 days, and are yet in good order. References on application.

July 2, 1877.

NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS AND COLLIERIES,

NEAR SHEFFIELD.

CELEBRATED SILKSTONE GAS COALS.

The various descriptions of Gas Coal produced from the above Collieries possess an unequalled reputation, combining in a large degree the constituents essential for the production of the best quality of Coke and Gas of a high illuminating power.

A recent extensive development of the Collieries enables us to offer increased supplies.

JAS. PATERSON, Esq., of Warrington, after testing various qualities of our Coal, has sent the following testimony of their merits:—

"Warrington Gaslight and Coke Company,
Offices, Mersey Street, Warrington, April 23, 1877.

"MESSRS. NEWTON, CHAMBERS, AND CO.,

"GENTLEMEN,—After carefully testing the various samples of Gas Coals sent from your Collieries for analysis, I have pleasure in reporting them as belonging to the highest class of Gas and Coking Coals.

"The average of Nine samples gives a yield of **12,500** cubic feet of **15½**-Candle Gas, being equivalent to **664** lbs. of sperm per ton, and **1420** lbs. of fixed carbon of a very superior quality. All the samples bear a close relation to each other in value.

"Yours truly, "JAMES PATERSON."

Full particulars will be sent on application to us—address as above.

NEW PATENT WET GAS-METER,

THE "RELIANCE,"

MANUFACTURED BY THE

GAS-METER COMPANY, LIMITED,

238, KINGSLAND ROAD, LONDON; UNION STREET, OLDHAM; HANOVER STREET, DUBLIN.

The object attained by this invention is the *correct measurement of Gas under every fluctuation of the pressure.*

Accuracy is obtained by subjecting the whole of the water which determines the measuring chambers of the drum to one uniform even pressure, and so prevents unequal displacements of the water-line.

The "RELIANCE" METER has been tested by several of the most experienced official meter inspectors. Copies of their reports may be obtained on application to the

GAS-METER COMPANY, LIMITED,

238, KINGSLAND ROAD, LONDON.

MR. A. VERNON HARCOURT'S COLOUR TESTS,

FOR BISULPHIDE OF CARBON, SULPHURETTED HYDROGEN, AND CARBONIC ACID IN COAL GAS.

The demand for these instruments since A. Wright and Co. have had the manufacture and sale in their hands, has been so great as to necessitate their production in the same form generally as that of the model furnished to them; but improvements, which some time since received the approval of Mr. Harcourt, have been made, which render the apparatus more compact and convenient in several respects. The new form will also, when required, be made, *at extra cost*, with platinum instead of with glass bulbs. Drawings and particulars will be shortly ready. In the meantime, the instrument sent out will be as described in Mr. Harcourt's instructions, a copy of which will be sent per post on receipt of 2d. in stamps.

ALEXANDER WRIGHT & CO.,

GAS-METER AND APPARATUS MANUFACTURERS,

55, 55a, & 56, MILLBANK STREET, WESTMINSTER, LONDON, S.W.

F. W. HARTLEY, Manager.

R. LAIDLAW AND SON,

EDINBURGH AND GLASGOW.

Manufacturers of

CONSUMERS IMPROVED WET GAS-METERS,

THE UNVARYING WATER-LINE GAS-METERS,

IMPROVED DRY GAS-METERS, in Cast-Iron or Tin-Plate Cases;

STATION-METERS, ALL SIZES, up to 15 feet Square, with PLANED JOINTS;

Experimental Meters, Photometers, Pressure-Gauges,

Governors, Test Holders, &c., &c.

LONDON OFFICE: 106, CANNON STREET, E.C.

JOHN ABBOT & CO., LIMITED,

MANUFACTURERS OF

IMPROVED

HYDRAULIC CRANES & HOISTS,

Effecting an IMMENSE SAVING in the cost of discharging Coals from Vessels, Barges, &c.

HYDRAULIC RAMS FOR LIFTING AND LOWERING PURIFIER COVERS.

GAS PLANT GENERALLY, PIPES, ROOFING, TANKS, &c.,

PARK WORKS, GATESHEAD.

LONDON OFFICES:
2, SUFFOLK LANE, CANNON STREET, E.C.

GLASGOW OFFICES:
54, ST. ENOCH'S SQUARE.

London: Printed by WILLIAM BOUGHTON KING (at the office of Clayton and Co. 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, Feb. 19, 1878.